

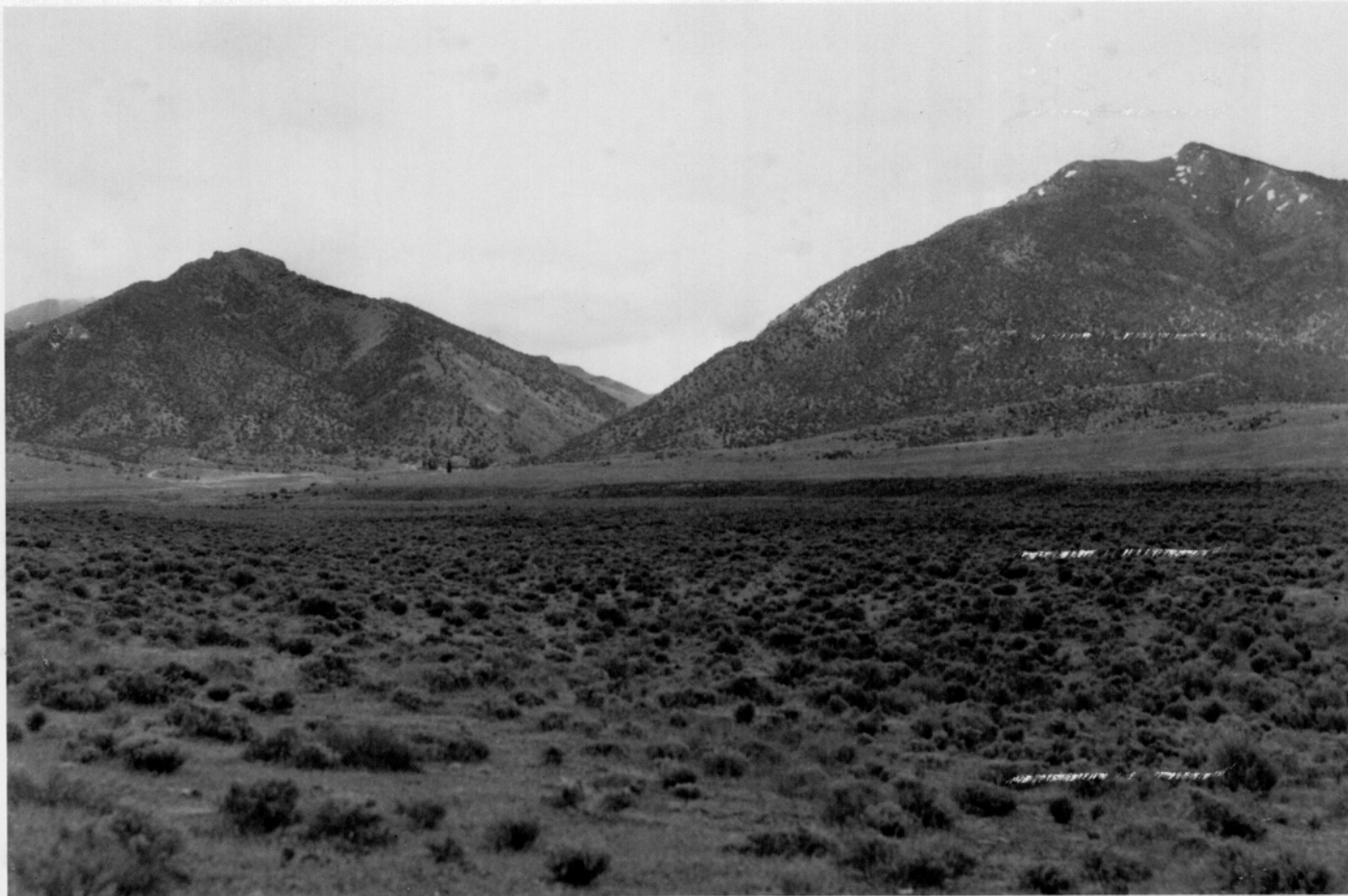


United States  
Department of  
Agriculture

Soil  
Conservation  
Service

In cooperation with  
United States Department  
of the Interior, Bureau of  
Land Management, and  
University of Nevada,  
Agricultural Experiment  
Station

# Soil Survey of Lander County, Nevada, North Part (Volume I)



# How To Use This Soil Survey

## General Soil Map

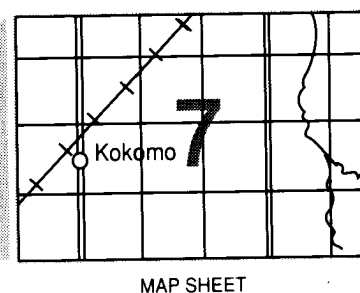
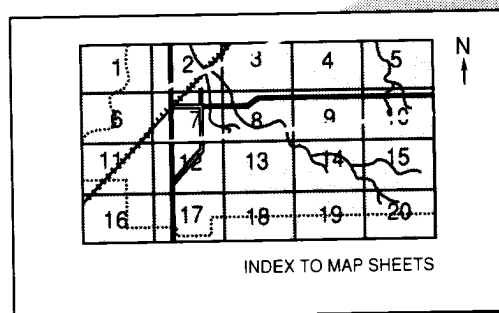
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

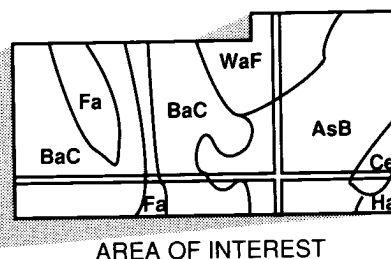
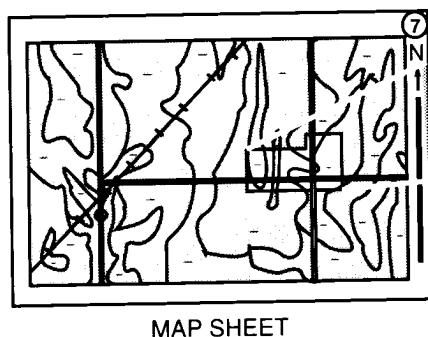
## Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.



---

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1983. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1983. This survey was made cooperatively by the Soil Conservation Service; the United States Department of the Interior, Bureau of Land Management; and the University of Nevada, Agriculture Experiment Station. It is part of the technical assistance furnished to the Lander County Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

**Cover: A typical landform sequence in Lander County, Nevada, North Part. This is along Trout Creek in the Shoshone Range south of Battle Mountain. In the foreground, Doowak and Veta soils are dominant on the inset fans. In the near middleground, Oxcorel, Dun Glen, and Whirlo soils are dominant on fan skirts and low fan piedmont remnants. In the far middleground, Tomera, Snapp, and Whirlo soils are on a fan piedmont remnant. In the background, Glean, Locane, Pernty, and Sumine soils are dominant on the mountains.**

# Contents

---

|                                              |      |
|----------------------------------------------|------|
| <b>Index to map units</b> .....              | vi   |
| <b>Summary of tables</b> .....               | xi   |
| <b>Foreword</b> .....                        | xiii |
| General nature of the survey area .....      | 1    |
| How this survey was made .....               | 3    |
| Soil landscapes .....                        | 5    |
| <b>General soil map units</b> .....          | 11   |
| Map unit descriptions .....                  | 11   |
| Broad land use considerations .....          | 23   |
| <b>Detailed soil map units</b> .....         | 25   |
| Map unit descriptions .....                  | 28   |
| <b>Prime farmland</b> .....                  | 673  |
| <b>Use and management of the soils</b> ..... | 675  |
| Crops and pasture .....                      | 675  |
| Rangeland .....                              | 678  |
| Woodland management .....                    | 679  |
| Woodland understory vegetation .....         | 680  |
| Windbreaks and environmental plantings ..... | 680  |
| Wildlife habitat .....                       | 680  |
| Recreation .....                             | 681  |
| Engineering .....                            | 681  |
| <b>Soil properties</b> .....                 | 685  |
| Engineering index properties .....           | 685  |
| Physical and chemical properties .....       | 686  |
| Soil and water features .....                | 687  |
| <b>Classification of the soils</b> .....     | 689  |
| Soil series and their morphology .....       | 689  |
| Akerue series .....                          | 689  |
| Alley series .....                           | 690  |
| Allor series .....                           | 691  |
| Alyan series .....                           | 692  |
| Antel series .....                           | 693  |
| Argenta series .....                         | 695  |
| Atlow series .....                           | 695  |
| Attella series .....                         | 696  |
| Batan series .....                           | 697  |
| Belate series .....                          | 698  |
| Beoska series .....                          | 699  |
| Beowawe series .....                         | 700  |
| Beowawe Variant .....                        | 701  |
| Berning series .....                         | 702  |
| Bioya series .....                           | 703  |

|                            |     |
|----------------------------|-----|
| Blacka series .....        | 704 |
| Blackhawk series .....     | 705 |
| Bojo series .....          | 706 |
| Boulflat series .....      | 707 |
| Bregar series .....        | 708 |
| Broyles series .....       | 709 |
| Bubus series .....         | 710 |
| Bucan series .....         | 711 |
| Buffaran series .....      | 712 |
| Burnborough series .....   | 713 |
| Burrita series .....       | 714 |
| Caniwe series .....        | 714 |
| Chen series .....          | 715 |
| Cherry Spring series ..... | 716 |
| Chiara series .....        | 717 |
| Clanalpine series .....    | 718 |
| Cleavage series .....      | 719 |
| Colbar series .....        | 719 |
| Cortez series .....        | 720 |
| Coztur series .....        | 721 |
| Creemon series .....       | 722 |
| Cren series .....          | 723 |
| Davey series .....         | 724 |
| Desatoya series .....      | 725 |
| Dewar series .....         | 727 |
| Doowak series .....        | 728 |
| Duffer series .....        | 728 |
| Dun Glen series .....      | 729 |
| Dunphy series .....        | 730 |
| Enko series .....          | 731 |
| Filiran series .....       | 732 |
| Floer series .....         | 734 |
| Genaw series .....         | 735 |
| Ginex series .....         | 735 |
| Glean series .....         | 736 |
| Golconda series .....      | 737 |
| Goldrun series .....       | 738 |
| Graley series .....        | 739 |
| Graley Variant .....       | 739 |
| Grassval series .....      | 740 |
| Grina series .....         | 741 |
| Gund series .....          | 742 |

|                              |     |                               |     |
|------------------------------|-----|-------------------------------|-----|
| Handy series . . . . .       | 743 | Osoll Variant . . . . .       | 778 |
| Hapgood series . . . . .     | 744 | Oxcorel series . . . . .      | 779 |
| Havingdon series . . . . .   | 744 | Packer series . . . . .       | 781 |
| Hessing series . . . . .     | 745 | Paranat series . . . . .      | 782 |
| Hooplite series . . . . .    | 746 | Perlor series . . . . .       | 783 |
| Hopeka series . . . . .      | 747 | Pernty series . . . . .       | 784 |
| Humboldt series . . . . .    | 748 | Perwick series . . . . .      | 784 |
| Humdun series . . . . .      | 749 | Pineval series . . . . .      | 785 |
| Isolde series . . . . .      | 750 | Prida series . . . . .        | 786 |
| Itca series . . . . .        | 751 | Puett series . . . . .        | 787 |
| Izod series . . . . .        | 752 | Pumper series . . . . .       | 788 |
| Jenor series . . . . .       | 752 | Punchbowl series . . . . .    | 789 |
| Jung series . . . . .        | 753 | Quarz series . . . . .        | 790 |
| Kelk series . . . . .        | 754 | Raglan series . . . . .       | 790 |
| Kingingham series . . . . .  | 755 | Rasille series . . . . .      | 792 |
| Kodra series . . . . .       | 756 | Redflame series . . . . .     | 793 |
| Koynik series . . . . .      | 757 | Rednik series . . . . .       | 794 |
| Koynik Variant . . . . .     | 758 | Reese series . . . . .        | 795 |
| Kram series . . . . .        | 758 | Reina series . . . . .        | 796 |
| Kram Variant . . . . .       | 759 | Relley series . . . . .       | 797 |
| Landco series . . . . .      | 760 | Reluctan series . . . . .     | 798 |
| Laped series . . . . .       | 761 | Ricert series . . . . .       | 798 |
| Layview series . . . . .     | 762 | Rixie series . . . . .        | 800 |
| Linrose series . . . . .     | 762 | Robson series . . . . .       | 801 |
| Locane series . . . . .      | 763 | Roca series . . . . .         | 801 |
| Loncan series . . . . .      | 764 | Rose Creek series . . . . .   | 802 |
| Loncan Variant . . . . .     | 764 | Rosney series . . . . .       | 803 |
| Malpais series . . . . .     | 765 | Settlemyer series . . . . .   | 804 |
| McConnel series . . . . .    | 766 | Shabliss series . . . . .     | 805 |
| McVegas series . . . . .     | 767 | Skullwak series . . . . .     | 806 |
| Midraw series . . . . .      | 768 | Slaven series . . . . .       | 807 |
| Millerlux series . . . . .   | 769 | Snapp series . . . . .        | 808 |
| Minat series . . . . .       | 769 | Sodhouse series . . . . .     | 809 |
| Misad series . . . . .       | 770 | Softscrabble series . . . . . | 810 |
| Needle Peak series . . . . . | 771 | Sombrero series . . . . .     | 811 |
| Newpass series . . . . .     | 772 | Sonoma series . . . . .       | 812 |
| Ninemile series . . . . .    | 773 | Sonoma Variant . . . . .      | 813 |
| Norfolk series . . . . .     | 774 | Soolake series . . . . .      | 814 |
| Ocala series . . . . .       | 775 | Spike series . . . . .        | 815 |
| Old Camp series . . . . .    | 776 | Stingdorn series . . . . .    | 816 |
| Orovada series . . . . .     | 777 | Sumine series . . . . .       | 817 |
| Osoll series . . . . .       | 778 | Susie Creek series . . . . .  | 818 |

|                       |     |
|-----------------------|-----|
| Teguro series.....    | 819 |
| Teman series.....     | 819 |
| Tenabo series.....    | 820 |
| Tessfive series.....  | 822 |
| Tomera series.....    | 822 |
| Trunk series.....     | 823 |
| Tulase series.....    | 824 |
| Tusel series.....     | 825 |
| Tweba series.....     | 826 |
| Umberland series..... | 827 |
| Unsel Variant.....    | 828 |
| Valmy series.....     | 829 |
| Vanwyper series.....  | 829 |
| Veta series.....      | 830 |
| Walti series.....     | 831 |
| Welch series.....     | 832 |
| Wendane series.....   | 833 |
| Wendane Variant.....  | 834 |

|                                                      |             |
|------------------------------------------------------|-------------|
| Weso series.....                                     | 835         |
| Whirlo series.....                                   | 836         |
| Wholan series.....                                   | 837         |
| Wieland series.....                                  | 838         |
| Winada series.....                                   | 839         |
| Winada Variant.....                                  | 840         |
| Wiskan series.....                                   | 841         |
| Xine series.....                                     | 842         |
| Yipor series.....                                    | 842         |
| Zineb series.....                                    | 843         |
| Zoesta series.....                                   | 844         |
| Zoesta Variant.....                                  | 845         |
| <b>Formation of the soils.....</b>                   | <b>847</b>  |
| <b>References.....</b>                               | <b>855</b>  |
| <b>Glossary.....</b>                                 | <b>857</b>  |
| <b>Appendix.....</b>                                 | <b>869</b>  |
| <b>Tables.....</b>                                   | <b>881</b>  |
| <b>Rangeland plants and woodland understory.....</b> | <b>1013</b> |

Issued May 1992



# Index to Map Units

|                                                              |    |                                                                                    |     |
|--------------------------------------------------------------|----|------------------------------------------------------------------------------------|-----|
| 102—Beowawe Variant-Tomera-Whirlo association .....          | 28 | 212—Blacka-Broyles very fine sandy loams, 2 to 8 percent slopes .....              | 92  |
| 112—Millerlux-Reluctan-Cleavage association .....            | 30 | 213—Blacka-Broyles very fine sandy loams, saline, 2 to 4 percent slopes .....      | 94  |
| 120—Alyan-Graley-Rock outcrop association .....              | 32 | 220—Blackhawk very fine sandy loam, 2 to 8 percent slopes .....                    | 96  |
| 130—Alley-Dewar association .....                            | 34 | 230—Broyles very fine sandy loam, 0 to 2 percent slopes .....                      | 97  |
| 131—Alley-Rock outcrop-Rubble land association .....         | 36 | 231—Broyles very fine sandy loam, 2 to 4 percent slopes .....                      | 98  |
| 140—Antel silt loam .....                                    | 37 | 232—Broyles very fine sandy loam, cemented substratum, 0 to 2 percent slopes ..... | 99  |
| 141—Antel silt loam, moderately sodic .....                  | 38 | 233—Broyles very fine sandy loam, moderately saline, 0 to 2 percent slopes .....   | 100 |
| 142—Antel silty clay loam .....                              | 39 | 235—Broyles-Creemon association .....                                              | 101 |
| 143—Antel silty clay loam, occasionally flooded .....        | 40 | 237—Broyles-Beoska-Orovada association .....                                       | 103 |
| 150—Argenta very fine sandy loam .....                       | 41 | 240—Bubus very fine sandy loam .....                                               | 105 |
| 152—Argenta-Sonoma complex .....                             | 42 | 242—Bubus very fine sandy loam, gravelly substratum .....                          | 106 |
| 160—Batan fine sandy loam .....                              | 44 | 243—Bubus-Playas complex .....                                                     | 107 |
| 161—Batan silt loam .....                                    | 45 | 244—Bubus-Relley complex .....                                                     | 108 |
| 162—Batan silt loam, occasionally flooded .....              | 46 | 245—Bubus-Needle Peak-Yipor association .....                                      | 110 |
| 163—Batan silt loam, slightly saline .....                   | 47 | 247—Bubus-Isolde association .....                                                 | 112 |
| 164—Batan-Raglan-Rosney association .....                    | 48 | 248—Bubus-Batan-Reese association .....                                            | 114 |
| 166—Batan-Wendane-Sonoma association .....                   | 50 | 251—Bucan-Bucan, steep, association .....                                          | 116 |
| 167—Batan-Wendane-Valmy association .....                    | 52 | 252—Bucan-Humdun-Rock outcrop association .....                                    | 117 |
| 168—Batan-Bubus-Ocala association .....                      | 54 | 262—Chen-Slaven-Chen, cobbly, association .....                                    | 119 |
| 169—Batan-Ocala-Ocala, rarely flooded, association .....     | 56 | 272—Cherry Spring-Enko association .....                                           | 121 |
| 170—Beoska silt loam, 0 to 2 percent slopes .....            | 59 | 282—Chiara-Orovada association .....                                               | 123 |
| 171—Beoska silt loam, 2 to 8 percent slopes .....            | 60 | 283—Chiara-Tenabo association .....                                                | 125 |
| 172—Beoska-Tenabo silt loams, nearly level .....             | 61 | 284—Chiara-Dewar association .....                                                 | 126 |
| 173—Beoska-Tenabo silt loams, sloping .....                  | 63 | 285—Chiara-Trunk-Midraw association .....                                          | 128 |
| 174—Beoska-Chiara association .....                          | 65 | 286—Chiara-Jenor association .....                                                 | 130 |
| 175—Beoska-Jenor association .....                           | 67 | 290—Creemon silt loam, 0 to 2 percent slopes .....                                 | 132 |
| 177—Beoska-Oxcurel-McConnel association .....                | 69 | 291—Creemon silt loam, 2 to 4 percent slopes .....                                 | 133 |
| 178—Beoska-Malpais-Old Camp association .....                | 71 | 292—Creemon silt loam, 0 to 2 percent slopes, occasionally flooded .....           | 134 |
| 181—Beoska-Orovada association .....                         | 74 | 293—Creemon silt loam, strongly saline, 0 to 2 percent slopes .....                | 135 |
| 182—Beoska-Whirlo-Misad association .....                    | 75 | 294—Creemon-Orovada-Broyles association .....                                      | 137 |
| 183—Beoska-Dewar-Orovada association .....                   | 78 | 295—Creemon-Cren association .....                                                 | 139 |
| 185—Beowawe silt loam .....                                  | 80 | 296—Creemon-Hessing association .....                                              | 141 |
| 192—Vanwyper-Trunk-Trunk, steep, association .....           | 81 |                                                                                    |     |
| 193—Berning-Alley association .....                          | 84 |                                                                                    |     |
| 200—Sonoma Variant silt loam .....                           | 85 |                                                                                    |     |
| 202—Bioya-Chiara-Cortez association .....                    | 86 |                                                                                    |     |
| 203—Bioya-Shabliss-Puett association .....                   | 88 |                                                                                    |     |
| 211—Blacka very fine sandy loam, 0 to 2 percent slopes ..... | 91 |                                                                                    |     |

|                                                                   |     |
|-------------------------------------------------------------------|-----|
| 297—Creemon-Orovada-Tulase association . . . . .                  | 142 |
| 298—Creemon-Misad association . . . . .                           | 145 |
| 300—Cren silt loam . . . . .                                      | 146 |
| 303—Cren-Doowak-Relley association . . . . .                      | 148 |
| 304—Cren-Raglan-Batan association . . . . .                       | 150 |
| 310—Davey fine sandy loam . . . . .                               | 152 |
| 312—Davey fine sandy loam, cemented<br>substratum . . . . .       | 153 |
| 313—Davey-Goldrun complex . . . . .                               | 154 |
| 340—Duffer very fine sandy loam . . . . .                         | 155 |
| 370—Enko fine sandy loam, 2 to 8 percent<br>slopes . . . . .      | 157 |
| 371—Enko-Shabliss-Orovada association . . . . .                   | 158 |
| 400—Glean-Walti-Cleavage association . . . . .                    | 160 |
| 411—Golconda-Blackhawk association . . . . .                      | 162 |
| 412—Golconda-Dun Glen association . . . . .                       | 164 |
| 413—Golconda-Blownout land complex . . . . .                      | 166 |
| 420—Goldrun fine sand, 0 to 4 percent slopes . . . . .            | 167 |
| 422—Goldrun-Old Camp association . . . . .                        | 168 |
| 441—Gund-Umberland association . . . . .                          | 169 |
| 442—Gund-Bubus-Wendane association . . . . .                      | 171 |
| 443—Gund-Batan association . . . . .                              | 173 |
| 461—Hapgood-Packer-Layview association . . . . .                  | 175 |
| 466—Hapgood-Tusel-Winada association . . . . .                    | 177 |
| 467—Hapgood-Sumine-Cleavage association . . . . .                 | 179 |
| 482—Humdun-Havingdon-Bucan association . . . . .                  | 182 |
| 486—Havingdon-Burrita association . . . . .                       | 184 |
| 511—Hessing silt loam . . . . .                                   | 186 |
| 512—Hessing-Relley association . . . . .                          | 187 |
| 530—Humboldt fine sandy loam . . . . .                            | 189 |
| 531—Humboldt silty clay . . . . .                                 | 190 |
| 532—Humboldt silty clay loam, slightly saline . . . . .           | 191 |
| 571—Jenor-Blacka very fine sandy loams . . . . .                  | 192 |
| 573—Jenor-Beoska-Broyles association . . . . .                    | 194 |
| 590—Landco silt loam . . . . .                                    | 196 |
| 602—Misad gravelly sandy loam, strongly<br>saline-sodic . . . . . | 197 |
| 605—Misad-Creemon-Rednik association . . . . .                    | 199 |
| 631—McConnel-Tulase association . . . . .                         | 201 |
| 660—Needle Peak silt loam, occasionally<br>flooded . . . . .      | 202 |
| 670—Filiran-Pineval-Kingingham association . . . . .              | 204 |

|                                                                                      |     |
|--------------------------------------------------------------------------------------|-----|
| 680—Skullwak-Umberland-Wendane association . . . . .                                 | 206 |
| 684—Ocala silt loam, occasionally flooded . . . . .                                  | 208 |
| 700—Orovada fine sandy loam, 0 to 2 percent<br>slopes . . . . .                      | 209 |
| 701—Orovada fine sandy loam, 2 to 4 percent<br>slopes . . . . .                      | 210 |
| 702—Orovada fine sandy loam, cemented<br>substratum, 0 to 2 percent slopes . . . . . | 211 |
| 703—Orovada-Goldrun complex . . . . .                                                | 213 |
| 704—Orovada-Kodra-Puett association . . . . .                                        | 214 |
| 705—Orovada-Creemon complex . . . . .                                                | 216 |
| 706—Orovada-Wieland-Chiara association . . . . .                                     | 218 |
| 707—Orovada-Goldrun association . . . . .                                            | 220 |
| 708—Orovada-Reina-Rock outcrop association . . . . .                                 | 222 |
| 709—Orovada-Sodhouse association . . . . .                                           | 223 |
| 711—Paranat silty clay loam . . . . .                                                | 225 |
| 713—Paranat silty clay loam, drained . . . . .                                       | 226 |
| 714—Paranat silty clay loam, occasionally<br>flooded . . . . .                       | 227 |
| 731—Yipor silt loam, moderately saline-sodic . . . . .                               | 228 |
| 740—Playas . . . . .                                                                 | 229 |
| 770—Prida silt loam . . . . .                                                        | 230 |
| 774—Prida-Sonoma silty clay loams . . . . .                                          | 231 |
| 780—Pumper silt loam . . . . .                                                       | 232 |
| 800—Raglan silt loam, gravelly substratum . . . . .                                  | 233 |
| 804—Raglan silty clay loam, moderately saline . . . . .                              | 235 |
| 805—Raglan silt loam . . . . .                                                       | 236 |
| 814—Quarz-Linrose-Slaven association . . . . .                                       | 237 |
| 816—Quarz-Linrose-Cleavage association . . . . .                                     | 239 |
| 830—Reese silt loam . . . . .                                                        | 242 |
| 835—Reese-Ocala association . . . . .                                                | 243 |
| 841—Wendane Variant silt loam . . . . .                                              | 244 |
| 850—Relley silt loam . . . . .                                                       | 245 |
| 851—Relley silt loam, cemented substratum . . . . .                                  | 246 |
| 852—Relley silt loam, strongly saline . . . . .                                      | 248 |
| 853—Relley silty clay loam . . . . .                                                 | 249 |
| 855—Relley-Broyles association . . . . .                                             | 250 |
| 861—Rixie silty clay loam, strongly saline . . . . .                                 | 252 |
| 862—Rixie silty clay loam, drained, strongly<br>saline . . . . .                     | 253 |
| 863—Rixie-Rixie, sodic, complex . . . . .                                            | 254 |
| 864—Rixie silty clay loam . . . . .                                                  | 255 |

|                                                                                         |     |                                                                                            |     |
|-----------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------|-----|
| 870—Roca-Bregar-Linrose association . . . . .                                           | 257 | 1087—Trunk-Burrita-Colbar association . . . . .                                            | 308 |
| 872—Roca-Linrose-Wiskan association . . . . .                                           | 259 | 1091—Tulase silt loam, 2 to 8 percent slopes . . . . .                                     | 310 |
| 873—Roca-Reluctan association . . . . .                                                 | 261 | 1092—Tulase-Bubus-McConnel association . . . . .                                           | 311 |
| 875—Roca-Glean-Bregar association . . . . .                                             | 263 | 1102—Tweba very fine sandy loam, drained,<br>0 to 4 percent slopes . . . . .               | 313 |
| 881—Rose Creek silt loam, drained, strongly<br>saline . . . . .                         | 265 | 1110—Umlerland silty clay loam, ponded . . . . .                                           | 314 |
| 882—Rose Creek silty clay loam . . . . .                                                | 266 | 1140—Wendane silt loam, frequently flooded . . . . .                                       | 315 |
| 883—Rose Creek-Paranat silty clay loams . . . . .                                       | 267 | 1141—Wendane silt loam, sandy substratum . . . . .                                         | 316 |
| 891—Rosney loam, cemented substratum . . . . .                                          | 269 | 1142—Wendane-Tweba association . . . . .                                                   | 318 |
| 892—Rosney silt loam . . . . .                                                          | 270 | 1143—Wendane silt loam, occasionally flooded . . . . .                                     | 319 |
| 970—Soolake very fine sandy loam, 0 to 2<br>percent slopes . . . . .                    | 271 | 1144—Wendane-Batan-Broyles association . . . . .                                           | 320 |
| 971—Soolake very fine sandy loam, 2 to 8<br>percent slopes . . . . .                    | 272 | 1145—Wendane-Playas association . . . . .                                                  | 323 |
| 972—Soolake-Dunphy-Argenta association . . . . .                                        | 273 | 1146—Wendane-Sonoma-Valmy association . . . . .                                            | 324 |
| 980—Sombrero very fine sandy loam . . . . .                                             | 275 | 1150—Weso fine sandy loam . . . . .                                                        | 326 |
| 990—Sonoma silt loam, drained . . . . .                                                 | 276 | 1158—Whirlo very fine sandy loam, 2 to 4 percent<br>slopes, occasionally flooded . . . . . | 327 |
| 991—Sonoma silt loam, drained, slightly saline . . . . .                                | 277 | 1160—Whirlo gravelly loam, 2 to 8 percent<br>slopes . . . . .                              | 328 |
| 992—Sonoma silt loam, strongly saline, rarely<br>flooded . . . . .                      | 279 | 1162—Whirlo silt loam, 0 to 2 percent slopes . . . . .                                     | 329 |
| 993—Sonoma silty clay loam, frequently flooded . . . . .                                | 280 | 1163—Whirlo silt loam, 2 to 4 percent slopes . . . . .                                     | 330 |
| 994—Sonoma silty clay loam, drained, strongly<br>saline, occasionally flooded . . . . . | 281 | 1165—Whirlo-Creemon association . . . . .                                                  | 332 |
| 995—Sonoma silty clay loam, strongly saline,<br>occasionally flooded . . . . .          | 282 | 1166—Whirlo-Pumper silt loams . . . . .                                                    | 333 |
| 996—Sonoma, strongly saline-Sonoma complex . . . . .                                    | 283 | 1168—Whirlo-Oxcorel association . . . . .                                                  | 335 |
| 997—Sonoma silty clay loam, strongly saline,<br>frequently flooded . . . . .            | 285 | 1169—Whirlo-Broyles association . . . . .                                                  | 336 |
| 1021—Susie Creek-Millerlux association . . . . .                                        | 286 | 1170—Wholan silt loam . . . . .                                                            | 338 |
| 1031—Teman silt loam . . . . .                                                          | 287 | 1174—Wholan silt loam, sandy substratum . . . . .                                          | 339 |
| 1032—Teman silt loam, clayey substratum . . . . .                                       | 289 | 1177—Wholan, strongly alkaline-Rasille<br>association . . . . .                            | 340 |
| 1033—Teman silt loam, strongly saline . . . . .                                         | 290 | 1178—Wholan-Rasille association . . . . .                                                  | 342 |
| 1040—Tenabo, gravelly-Allor-Tenabo association . . . . .                                | 291 | 1201—Slaven-Linrose-Cleavage association . . . . .                                         | 343 |
| 1041—Tenabo-Ricert association . . . . .                                                | 293 | 1202—Slaven-Wiskan-Graley Variant association . . . . .                                    | 345 |
| 1042—Tenabo very gravelly loam, 2 to 8 percent<br>slopes . . . . .                      | 295 | 1203—Slaven-Glean-Cleavage association . . . . .                                           | 348 |
| 1062—Tomera-Snapp-Whirlo association . . . . .                                          | 296 | 1212—Wiskan-Roca-Bregar association . . . . .                                              | 350 |
| 1080—Trunk-Burrita association . . . . .                                                | 298 | 1215—Wiskan-Locane association . . . . .                                                   | 352 |
| 1082—Trunk-Reina association . . . . .                                                  | 300 | 1216—Wiskan-Linrose association . . . . .                                                  | 354 |
| 1084—Trunk-Burrita-Rock outcrop association . . . . .                                   | 301 | 1220—Boulflat-Havingdon-Dewar association . . . . .                                        | 355 |
| 1085—Trunk-Dewar-Stingdorn association . . . . .                                        | 303 | 1221—Boulflat-Colbar-Old Camp association . . . . .                                        | 358 |
| 1086—Trunk-Malpais-Minat association . . . . .                                          | 306 | 1240—Redflame-Kingingham association . . . . .                                             | 360 |
|                                                                                         |     | 1263—Graley-Loncan-Bregar association . . . . .                                            | 362 |
|                                                                                         |     | 1280—Ricert-Oxcorel-Whirlo association . . . . .                                           | 364 |
|                                                                                         |     | 1281—Ricert-Whirlo-Pineval association . . . . .                                           | 366 |
|                                                                                         |     | 1283—Ricert-Kingingham-Oxcorel association . . . . .                                       | 369 |

|                                                              |     |
|--------------------------------------------------------------|-----|
| 1291—Kingingham-Tenabo-Sodhouse association . . . . .        | 371 |
| 1292—Kingingham-Golconda-Whirlo association . . . . .        | 373 |
| 1293—Kingingham-Oxcurel association . . . . .                | 376 |
| 1294—Kingingham-Whirlo-Beoska association . . . . .          | 377 |
| 1342—Doowak, cobbly-Doowak-Veta association . . . . .        | 380 |
| 1392—Rock outcrop-Loncan Variant-Glean association . . . . . | 382 |
| 1400—Koynik, steep-Koynik-Rock outcrop association . . . . . | 384 |
| 1410—Bojo-Stingdorn association . . . . .                    | 385 |
| 1411—Bojo-Rock outcrop-Osoll association . . . . .           | 387 |
| 1412—Bojo-Humdun-Boulflat association . . . . .              | 389 |
| 1420—Sumine-Reluctan-Cleavage association . . . . .          | 391 |
| 1421—Sumine-Softscrabble-Walti association . . . . .         | 393 |
| 1422—Sumine-Hapgood-Cleavage association . . . . .           | 396 |
| 1423—Sumine-Chen-Rock outcrop association . . . . .          | 398 |
| 1425—Sumine-Loncan association . . . . .                     | 400 |
| 1426—Sumine-Cleavage-Loncan association . . . . .            | 401 |
| 1427—Sumine-Itca-Softscrabble association . . . . .          | 404 |
| 1428—Sumine-Rubble land-Cleavage association . . . . .       | 406 |
| 1429—Sumine-Winada Variant-Pernty association . . . . .      | 408 |
| 1450—Atlow, steep-Atlow-Stingdorn association . . . . .      | 410 |
| 1451—Atlow-Reluctan-Trunk association . . . . .              | 412 |
| 1452—Atlow-Minat-Old Camp association . . . . .              | 415 |
| 1453—Atlow-Colbar-Rock outcrop association . . . . .         | 417 |
| 1532—Cleavage-Rubble land-Bregar association . . . . .       | 419 |
| 1542—Linrose-Cleavage-Pernty association . . . . .           | 420 |
| 1570—Koynik Variant-Oxcurel-Whirlo association . . . . .     | 422 |
| 1600—Dumps and Pits, mine . . . . .                          | 425 |
| 1601—Pits, gravel . . . . .                                  | 425 |
| 1662—Floer-Slaven-Roca association . . . . .                 | 425 |
| 1670—Wieland-Allor association . . . . .                     | 427 |
| 1671—Wieland-Oxcurel-Allor association . . . . .             | 429 |
| 1673—Wieland-Grassval-Puett association . . . . .            | 432 |
| 1680—Zineb gravelly loam, 2 to 8 percent slopes . . . . .    | 434 |
| 1682—Zineb-Doowak-Oxcurel association . . . . .              | 435 |
| 2060—Oxcurel-Beoska-Whirlo association . . . . .             | 437 |
| 2061—Oxcurel-Whirlo-Dun Glen association . . . . .           | 440 |
| 2062—Oxcurel-Orovada association . . . . .                   | 442 |

|                                                                      |     |
|----------------------------------------------------------------------|-----|
| 2064—Oxcurel-Misad association . . . . .                             | 443 |
| 2065—Oxcurel-Oxcurel, moderately steep-Pineval association . . . . . | 445 |
| 2066—Oxcurel-Broyles-Dun Glen association . . . . .                  | 447 |
| 2067—Oxcurel-Colbar-Stingdorn association . . . . .                  | 450 |
| 2068—Oxcurel-Golconda-Whirlo association . . . . .                   | 452 |
| 2069—Oxcurel-Rednik-Veta association . . . . .                       | 454 |
| 2090—Punchbowl-Robson-Reluctan association . . . . .                 | 457 |
| 2091—Punchbowl-Teguro-Sumine association . . . . .                   | 459 |
| 2092—Punchbowl-Belate-Reluctan association . . . . .                 | 462 |
| 2094—Punchbowl-Jung-Locane association . . . . .                     | 464 |
| 2098—Punchbowl-Clan Alpine-Sumine association . . . . .              | 466 |
| 2099—Punchbowl-Roca-Rock outcrop association . . . . .               | 469 |
| 2100—Grassval-Grina-Unsel Variant association . . . . .              | 471 |
| 2104—Grassval-Zineb-Izod association . . . . .                       | 473 |
| 2521—Stingdorn very cobbly loam, 4 to 30 percent slopes . . . . .    | 475 |
| 2522—Stingdorn-Stingdorn, steep-Colbar association . . . . .         | 477 |
| 2530—Perwick-Puett-Tulase association . . . . .                      | 479 |
| 2540—Buffaran-Wieland association . . . . .                          | 481 |
| 2541—Buffaran-Zoesta association . . . . .                           | 483 |
| 2550—Laped-Old Camp-Colbar association . . . . .                     | 484 |
| 2551—Laped-Colbar-Osoll association . . . . .                        | 487 |
| 2552—Laped-Old Camp-Puett association . . . . .                      | 489 |
| 2553—Laped-Stingdorn-Colbar association . . . . .                    | 491 |
| 2555—Laped-Colbar association . . . . .                              | 493 |
| 2561—Puett-Genaw-Orovada association . . . . .                       | 495 |
| 2571—Colbar, steep-Burrita-Colbar association . . . . .              | 497 |
| 2573—Colbar-Midraw association . . . . .                             | 500 |
| 2575—Colbar-Perwick-Settlemyer association . . . . .                 | 502 |
| 2591—Osoll Variant-Oxcurel association . . . . .                     | 504 |
| 2600—Grina-Caniwe-Handy association . . . . .                        | 506 |
| 2602—Grina-Grina, eroded-Caniwe association . . . . .                | 508 |
| 2620—Handy-Caniwe-Zoesta association . . . . .                       | 510 |
| 2621—Handy, gravelly-Handy-Zoesta association . . . . .              | 512 |
| 2631—Midraw-Minat-Pineval association . . . . .                      | 515 |
| 2640—Rasille-Kelk association . . . . .                              | 517 |
| 2652—Malpais-Stingdorn association . . . . .                         | 519 |
| 2670—Zoesta Variant-Jung-McVegas association . . . . .               | 521 |

|                                                                              |     |                                                                              |     |
|------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------|-----|
| 2681—Tessfive-Puett-Grina association . . . . .                              | 523 | 3433—Bregar-Punchbowl association . . . . .                                  | 594 |
| 2711—Burrita-Burnborough association . . . . .                               | 525 | 3451—Reluctan-Robson-Sumine association . . . . .                            | 596 |
| 2712—Burrita-Alley-Newpass association . . . . .                             | 527 | 3452—Reluctan-Sumine-Colbar association . . . . .                            | 598 |
| 2721—Burnborough-Sumine-Burrita association . . . . .                        | 529 | 3453—Reluctan-Locane-Itca association . . . . .                              | 601 |
| 2760—Ginex-Burrita-Burrita, south aspect,<br>association . . . . .           | 532 | 3455—Reluctan-Roca-Colbar association . . . . .                              | 603 |
| 2771—Kram-Hopeka-Rock outcrop association . . . . .                          | 534 | 3560—Locane-Robson-Bregar association . . . . .                              | 605 |
| 2783—Desatoya, steep-Spike-Desatoya<br>association . . . . .                 | 536 | 3561—Locane-Sumine-Glean association . . . . .                               | 608 |
| 2790—Old Camp-Minat-Osoll association . . . . .                              | 538 | 3564—Locane-Zoesta-Bucan association . . . . .                               | 610 |
| 2791—Old Camp-Colbar-Rock outcrop<br>association . . . . .                   | 541 | 3621—Minat-Bojo-Stingdorn association . . . . .                              | 612 |
| 2793—Old Camp-Laped association . . . . .                                    | 542 | 3622—Minat-Minat, eroded, association . . . . .                              | 615 |
| 2794—Old Camp-Kram Variant-Rock outcrop<br>association . . . . .             | 544 | 3624—Minat-Colbar-Atlow association . . . . .                                | 616 |
| 2796—Old Camp-Osoll-Colbar association . . . . .                             | 546 | 3650—McVegas-Old Camp-Kingingham<br>association . . . . .                    | 619 |
| 2797—Old Camp, steep-Colbar-Old Camp<br>association . . . . .                | 548 | 3651—McVegas-Beoska association . . . . .                                    | 621 |
| 2798—Old Camp-Atlow-Osoll association . . . . .                              | 551 | 3652—McVegas-Stingdorn-Colbar association . . . . .                          | 623 |
| 2800—Old Camp-Walti-Softscrabble association . . . . .                       | 553 | 3661—Dun Glen-Whirlo association . . . . .                                   | 625 |
| 2801—Old Camp-Rock outcrop-Colbar<br>association, strongly sloping . . . . . | 555 | 3690—Izod-Koynik-Rock outcrop association . . . . .                          | 627 |
| 2802—Old Camp-Rock outcrop-Colbar<br>association, steep . . . . .            | 557 | 3691—Izod-Rock outcrop association . . . . .                                 | 629 |
| 3071—Allor-Wieland association . . . . .                                     | 559 | 3693—Izod-Attella-Xine association . . . . .                                 | 630 |
| 3111—Ninemile-Zoesta-Itca association . . . . .                              | 561 | 3740—Kelk silt loam, saline, 0 to 4 percent<br>slopes . . . . .              | 632 |
| 3121—Walti-Softscrabble-Bucan association . . . . .                          | 563 | 3741—Kelk-Settlemyer association . . . . .                                   | 633 |
| 3122—Walti-Sumine-Softscrabble association . . . . .                         | 565 | 3742—Kelk-Ocala association . . . . .                                        | 635 |
| 3127—Walti-Cleavage-Softscrabble association . . . . .                       | 568 | 3840—Jung-Norfork-Buffaran association . . . . .                             | 636 |
| 3134—Itca-Clanalpine-Sumine association . . . . .                            | 570 | 3841—Jung-Itca-Roca association . . . . .                                    | 639 |
| 3150—Robson-Wiskan association . . . . .                                     | 573 | 3843—Jung, steep-Robson-Jung association . . . . .                           | 641 |
| 3152—Robson-Reluctan association . . . . .                                   | 574 | 3845—Jung-Stingdorn-Atlow association . . . . .                              | 643 |
| 3156—Robson-Old Camp-Rock outcrop<br>association . . . . .                   | 576 | 3846—Jung-Wiskan association . . . . .                                       | 646 |
| 3203—Dewar-Sodhouse-Bojo association . . . . .                               | 578 | 3881—Layview-Packer-Hapgood association . . . . .                            | 647 |
| 3410—Zoesta-Wieland-Akerue association . . . . .                             | 580 | 3950—Hooplite-Jung-Izod association . . . . .                                | 649 |
| 3413—Zoesta-Reluctan association . . . . .                                   | 582 | 3961—Pineval-Orovada-Beoska association . . . . .                            | 652 |
| 3415—Zoesta-Handy association . . . . .                                      | 584 | 3990—Settlemyer fine sandy loam, drained,<br>0 to 4 percent slopes . . . . . | 654 |
| 3417—Zoesta-Loncan-Welch association . . . . .                               | 585 | 3992—Settlemyer, drained-Settlemyer loams . . . . .                          | 655 |
| 3420—Belate-Sumine-Softscrabble association . . . . .                        | 588 | 4051—Attella-Xine-Kram association . . . . .                                 | 657 |
| 3423—Belate-Cleavage-Softscrabble association . . . . .                      | 590 | 4070—Genaw-Wieland-Grina association . . . . .                               | 659 |
| 3432—Bregar-Roca-Quarz association . . . . .                                 | 592 | 4071—Genaw-Perlor-Puett association . . . . .                                | 662 |
|                                                                              |     | 4072—Genaw-Orovada-Puett association . . . . .                               | 664 |
|                                                                              |     | 4091—Coztur-Genaw association . . . . .                                      | 666 |
|                                                                              |     | 4093—Coztur-Teguro-Punchbowl association . . . . .                           | 668 |
|                                                                              |     | 4140—Welch loam, drained, 2 to 8 percent<br>slopes . . . . .                 | 670 |

# Summary of Tables

---

|                                                                     |      |
|---------------------------------------------------------------------|------|
| Temperature and precipitation (table 1) .....                       | 882  |
| Freeze dates in spring and fall (table 2) .....                     | 883  |
| <i>Probability. Temperature.</i>                                    |      |
| Growing season (table 3) .....                                      | 884  |
| Acreage and proportionate extent of the soils (table 4) .....       | 885  |
| <i>Acres. Percent.</i>                                              |      |
| Engineering index properties (table 5) .....                        | 891  |
| <i>Depth. USDA texture. Classification—Unified, AASHTO.</i>         |      |
| <i>Fragments greater than 3 inches. Percentage passing</i>          |      |
| <i>sieve number—4, 10, 40, 200. Liquid limit. Plasticity index.</i> |      |
| Classification of the soils (table 6) .....                         | 1009 |
| <i>Family or higher taxonomic class.</i>                            |      |



# Foreword

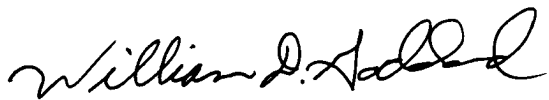
---

This soil survey contains information that can be used in land-planning programs in Lander County, Nevada, North Part. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the suitability of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

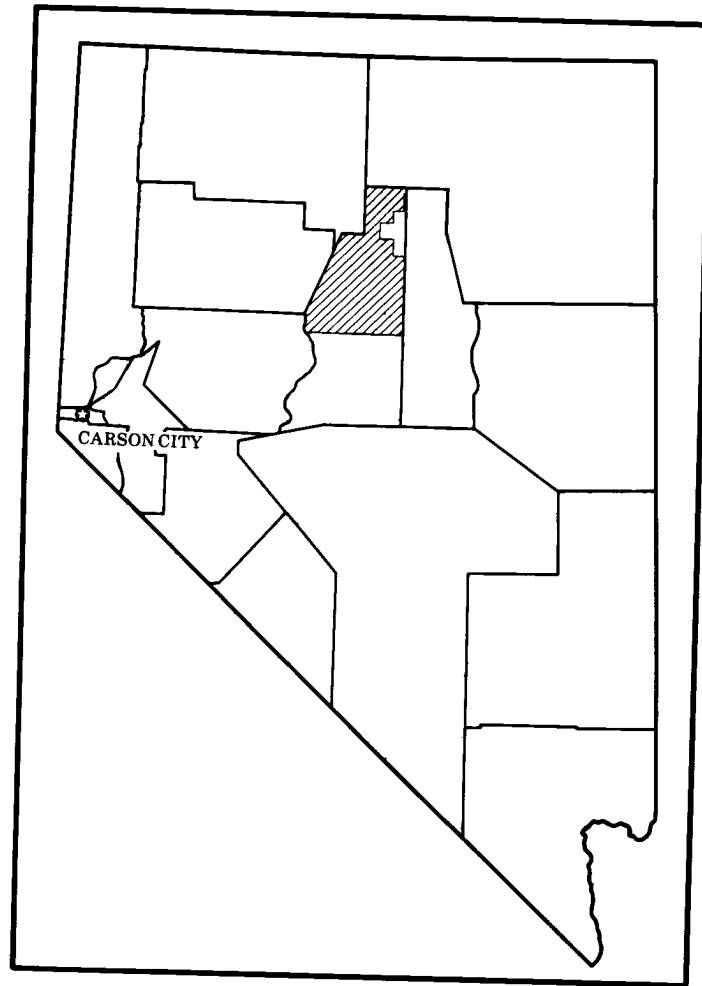
Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.



William D. Goddard  
State Conservationist  
Soil Conservation Service





Location of the survey area in Nevada.

# Soil Survey of Lander County, Nevada, North Part

---

By Carole E. Jett, Soil Conservation Service

Fieldwork by George J. Staidl, Michael T. Jackson, and Barry J. Strickler, Soil Conservation Service; Michael J. Zielinski and Steven Mellington, Bureau of Land Management; and Soil and Land Use Technology, Inc., under contract with the Bureau of Land Management

United States Department of Agriculture, Soil Conservation Service  
In cooperation with  
United States Department of the Interior, Bureau of Land Management, and University of Nevada, Agriculture Experiment Station

LANDER COUNTY, NORTH PART, is in the north-central part of Nevada. The survey area contains 1,588,530 acres, or 2,482 square miles. Battle Mountain is the only town located in the survey area.

The survey area is bounded on the west by Pershing and Humboldt Counties, on the north by Elko County, and on the east by Eureka County. The northeast part of the county is included in the Tuscarora Mountain Area soil survey.

The survey area consists of numerous north-south oriented mountain ranges and valleys. Elevations average 8,500 feet in the mountains and 4,500 feet in the valleys. The Humboldt River flows east to west across the northern part of the survey area. The Reese River flows south to north and bisects the central part.

The Bureau of Land Management administers all public land in the survey area.

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those on soil maps for adjacent survey areas. Differences are the result of better knowledge of soils, modifications in series concepts, intensity of mapping, or the extent of soils within the survey.

## General Nature of the Survey Area

This section gives general information about the survey area. It briefly discusses history, water supply, industries and transportation, drainage, geology, and climate.

## History

The first explorers in Lander County were members of the Peter Skeen Ogden expedition in 1828. Ogden and others worked their way upstream on the Humboldt River bottom lands, trapping beavers and other furbearers. In 1841, the first party of migrants on its way to California came into the area. By 1844, the winding course of the Humboldt River became known as the "Humboldt Trail," the main thoroughfare for the westward migration.

Development began in 1869 with the completion of the transcontinental railroad, which opened the area to both eastern and western markets. The town of Battle Mountain developed as a railroad station and terminal for the freight and stage roads to the south. About this time the numerous mines caused the area to boom. During the 1890's, an expanding cattle industry replaced mining as the economic base.

After the discovery of barite, gold, and copper, mining again became the economic base. Farming, both livestock and crop production, diversifies the local economy.

## Water Supply

Wells and streams supply irrigation water. In the arid valleys, wells are used to irrigate alfalfa and small grains. Stream water is used in irrigating native meadows and pastures along drainageways. At the

higher elevations, numerous small springs, seeps, and small, intermittent streams provide adequate water sources for livestock and wildlife.

Battle Mountain obtains its water supply from deep underground wells. Rural areas also fill their domestic water needs from wells or dependable springs.

## Industries and Transportation

The major industries in the survey area are mining, ranching, and irrigated crop production.

Mining provides most of the employment in the area. Gold and barite are the major minerals mined, and copper and turquoise make up a smaller portion (25).

The ranches are mainly cow-calf operations that sell the calves in fall.

Irrigated crops are produced mostly in the Middle Reese River Valley, Antelope Valley, and North Battle Mountain areas. The main crops are alfalfa hay, alfalfa seed, and small grains.

The Southern Pacific and Western Pacific Railroads parallel the Humboldt River across the northern part of the survey area. The minerals mined in the area are shipped mostly by rail.

Interstate 80 runs east-west across the northern part of the survey area. State Highway 305 runs north-south between Battle Mountain and Austin, Nevada. Numerous dirt roads or jeep trails, which are accessible in summer and fall, cross the survey area.

## Drainage

The Reese River drains a large part of Lander County, North Part. It is an intermittent axial stream that flows northward through the survey area to join the Humboldt River near Battle Mountain. Rock Creek drains the northeastern corner of the survey area and joins the Humboldt River northeast of Battle Mountain. The Humboldt River flows westward and then northwestward across the northern part of the county and terminates in the Lahontan Basin at the Humboldt Sink.

The rest of the survey area consists of bolsons called Buffalo and Grass Valleys. These are basins that intermittent streams internally drain. These streams flow only in spring or during localized thunderstorms in summer and terminate at a central playa within these valleys.

## Geology

The geology of the survey area is variable and complex.

Most outcrops of pre-Tertiary rocks in this area

consist of sedimentary and metasedimentary rocks, mainly interbedded chert, shale, argillite, greenstone, and quartzite. These rocks dominate the Augusta, Battle Mountain, and most of the Shoshone and Toiyabe Ranges. Typically, Atlow, Linrose, Packer, and Slaven soils formed in these rocks.

The volcanic rocks in this area include rhyolitic and andesitic tuffs, welded ash-flow tuffs, basalt, and related pyroclastic rocks. Most of these were laid down during the Miocene and Pliocene Epochs. These rocks are dominant in the Sheep Creek Range and Fish Creek Mountains and are in small areas in the central Shoshone and Toiyabe Ranges. Typically, Colbar, Hooplite, Laped, and Walti soils formed in these rocks.

The oldest valley fill material is sediment of Tertiary age. It occurs along the Middle Reese River Valleys, in the Fish Creek Basin, and as old alluvial divides between the Carico and Reese Valleys and the Grass and Crescent Valleys. This valley fill, which is partially lithified, typically consists of siltstone, sandstone, conglomerate, and some beds of volcanic ash. Typically, Genaw, Perlur, Puett, and Tessfive soils formed in these deposits.

The fan piedmont slopes in the valleys are made up of older Quaternary alluvium with influence from loess and high amounts of volcanic ash. This alluvium is parent material of Beoska, Broyles, Tenabo, Whirlo, and other soils.

The youngest material in the area consists of recent alluvium along the flood plains of the Reese and Humboldt Rivers and on the lower valley floors. Typically, Batan, Ocala, Sonoma, and Wendane soils formed in this material.

## Climate

Prepared by the National Climatic Data Center, Asheville, North Carolina.

In Lander County, summers are hot, especially at lower elevations, and winters are cold. Rangeland takes in most of the survey area. At lower elevations precipitation is normally light during all months of the year. At higher elevations it is much greater and snow accumulates to considerable depths. Much of the snowmelt irrigates crops in nearby valleys. Climatic data for Austin included here closely resemble those for the southern part of the survey area and for areas at higher elevations.

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Austin and Battle Mountain, Nevada, for the period 1951-78. Table 2 shows probable dates of the first freeze in fall and last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 31 degrees F. The average daily minimum temperature is 19 degrees F. The lowest temperature on record, -30 degrees F, occurred at Battle Mountain on December 9, 1972. In summer, the average temperature is 68 degrees F. The average daily maximum temperature is about 86 degrees F. The highest temperature, 109 degrees F, was recorded at Battle Mountain on July 27, 1975.

Growing degree days, shown in table 1, are equivalent to "heat units." Beginning in spring, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 14 inches at Austin and 7 inches at Battle Mountain. Of this, 60 percent usually falls in April through September, which includes the growing season for most crops. The heaviest 1-day rainfall during the period of record was 2.27 inches at Battle Mountain on October 12, 1963. Thunderstorms occur on about 12 days each year.

Average seasonal snowfall is 40 inches at Austin and 24 inches at Battle Mountain. The greatest snow depth at any one time during the period of record was 23 inches at Austin. On the average, 31 days at Austin and 14 days at Battle Mountain have at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year. Every few years in the survey area a blizzard strikes with high winds and drifting snow. During blizzards, snow remains on the ground for many weeks, even at lower elevations, and livestock suffer.

The average relative humidity in midafternoon is about 30 percent. Humidity is higher at night, and the average at dawn is about 65 percent. The sun shines 85 percent of the time possible in summer and 60 percent in winter. The prevailing wind is from the west. Average windspeed is highest in spring and averages 9 miles per hour.

## How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. The fieldworkers mainly in the northern half of the survey area were soil scientists of the Soil Conservation Service and the Bureau of Land Management. Those mainly in the southern half of the area were soil scientists of Soil and Land Use

Technology, Inc., under contract to the Bureau of Land Management.

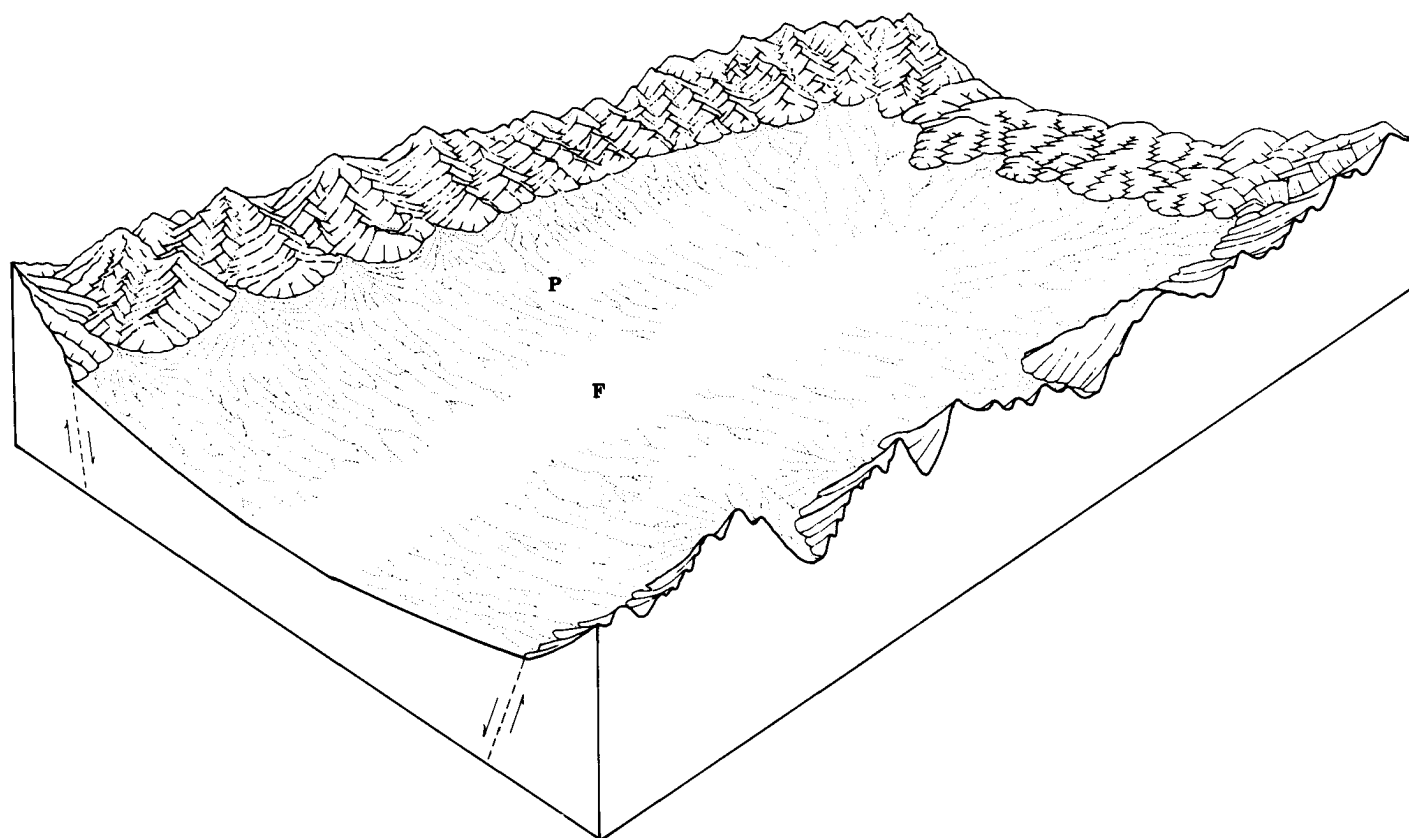
Some discrepancies were recognized when joining the Tuscarora Mountain Soil Survey Area. This older soil survey was completed within the framework of knowledge and standards that existed at the time. Also, the acreage of soils involved along the join is so small that no purpose was served to extend the delineations into this area. Because of a better understanding of soils and an improved methodology in mapping techniques, some of the soil names, map unit components, or physiographic positions may not be exactly the same. These advancements should have little or no effect in the use of this survey in managing soils.

The soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unmodified parent material in which the soil formed. The unmodified material is devoid of roots and most other living organisms, and biological activity has not changed it.

The soils and miscellaneous areas in the survey area are in orderly patterns related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil or miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge gradually into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size, and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining



**Figure 1.—The major physiographic parts of an internally-drained intermontane basin, or bolson: the piedmont slope (P) and the basin floor or, more specifically, the bolson floor (F). The schematic diagram shows part of an elongated bolson; bounding mountain ranges are on the near and far sides of the bolson and hills cut off the far end. The dotted lines are drainageways and suggest positions of major landforms. Neither the playa nor the drainageways of the floor are shown.**

their properties, the soil scientists assigned the soils to taxonomic classes.

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy is the system of taxonomic classification used in the United States. It is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. The soil scientists classified and named the soils in the survey area. Then they compared the individual soils with similar soils in the same taxonomic class in other areas. They did so to confirm data and assemble additional data based on experience and research.

Some typical pedons described are located in the southern part of Lander County, outside of the survey area. This situation exists because a large part of Lander County was mapped under a separate private contact. Soils that were already mapped at that time

and that were not mapped again within the survey area have the typical pedon description already available for those soils regardless of which survey area they are in. The affected typical pedon description has a statement under the heading "Type location" indicating its origin outside of the survey area. In some pedons, taxa are in map units that are similar but not identified within this survey area.

While the soil survey was in progress, samples of some of the soils in the area were collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties. In so doing, they determine the expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local

needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that in most years a given soil will have a high water table within certain depths. But they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

Soil scientists located and identified the significant natural bodies of soil in the survey area. Then they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

## Soil Landscapes

In this soil survey, the mapped areas generally represent associations of two or three soil components as well as other included soils of small extent. Soil patterns commonly coincide with landforms and physiographic positions. In the section "Detailed Soil Map Units," descriptive terms are used to identify where

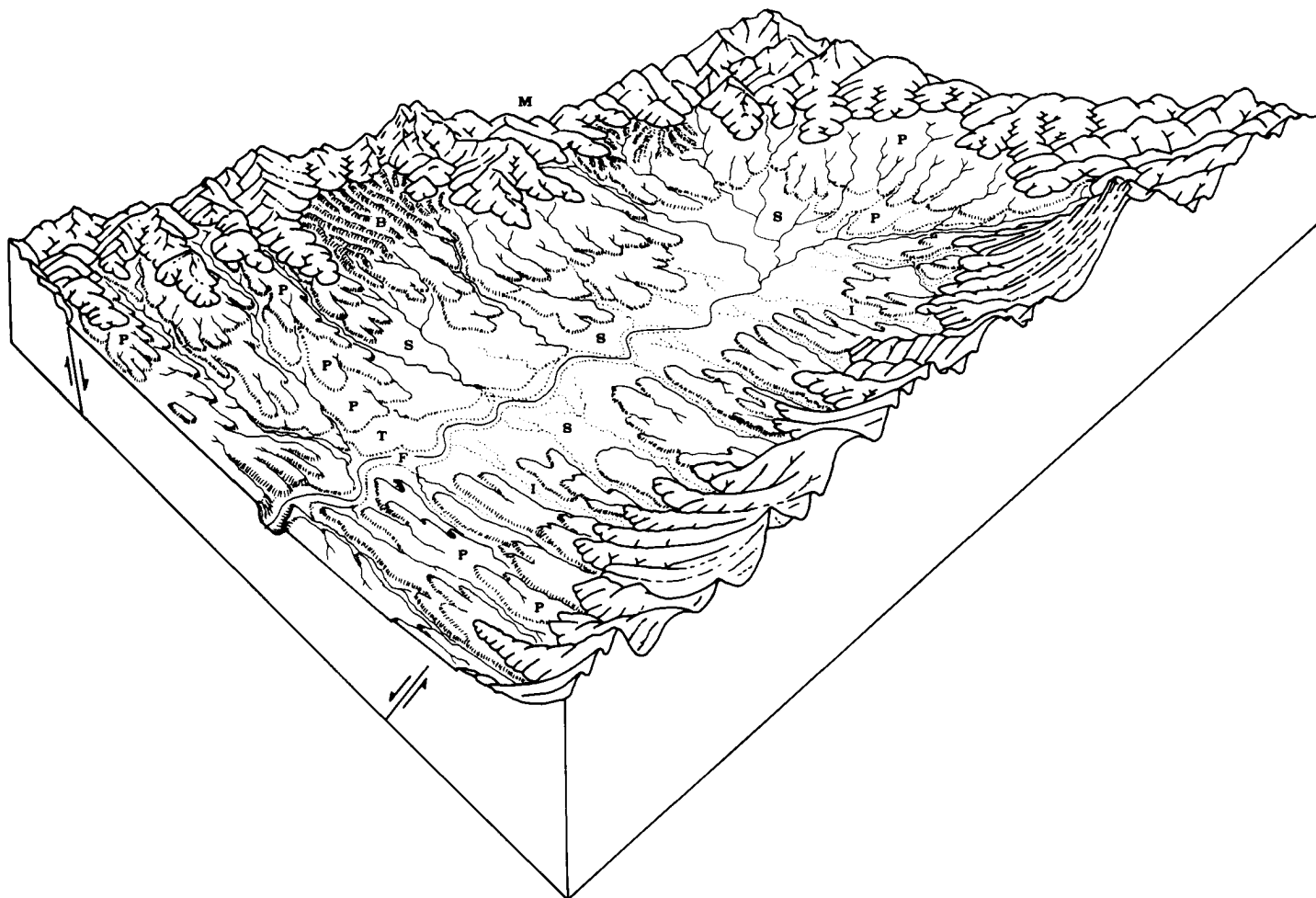
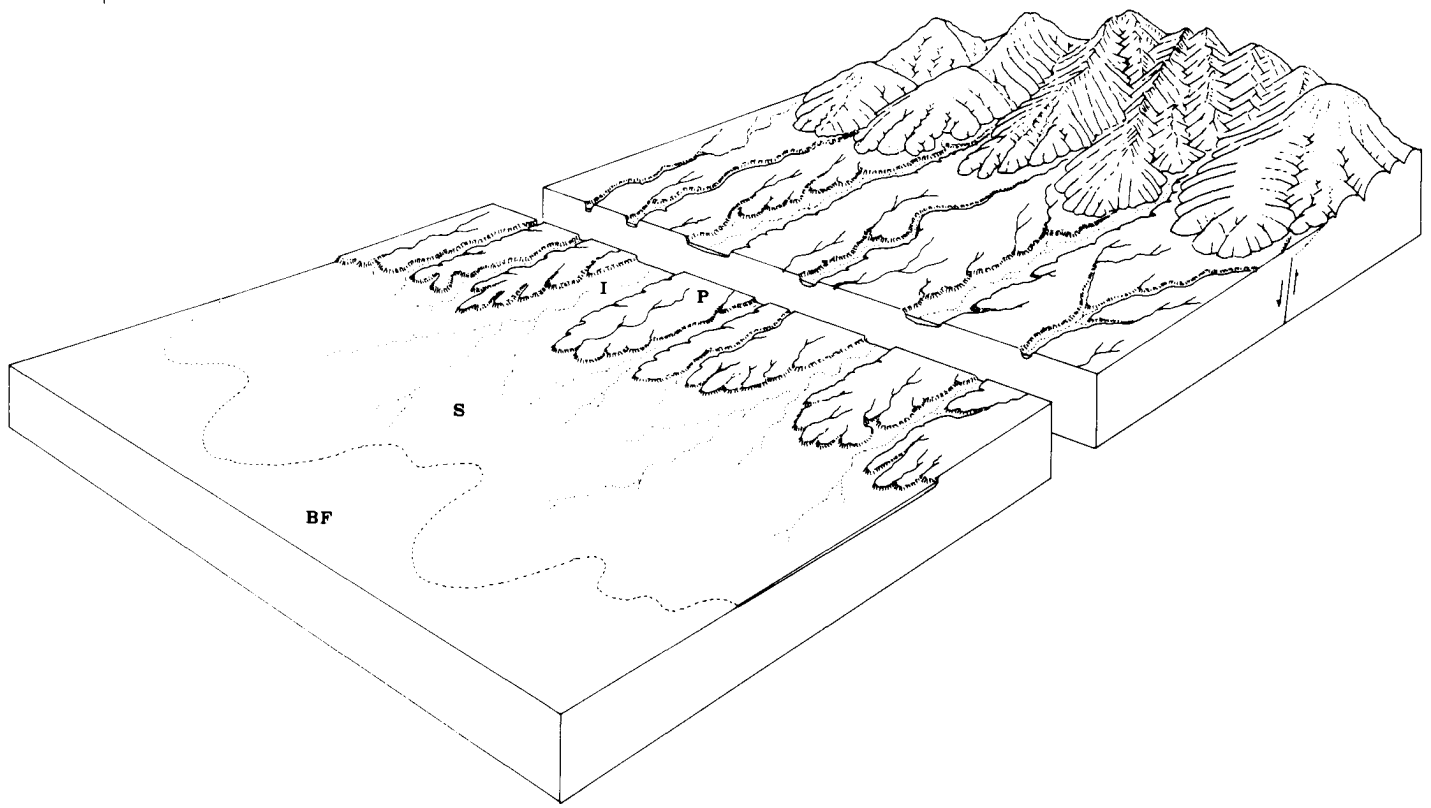


Figure 2.—The semibolson displays the effects of several cycles of dissection and deposition. The major landforms are ballenas (B), the fan piedmont (comprising several levels, or ages, of fan remnants) (P), the fan skirt (S), an axial stream terrace (T), and an axial stream flood plain (F). Alluvial fans are not distinguished from the fan piedmont. Inset fan (I) component landforms are located between fan remnants, and mountains bound the basin on two sides.



**Figure 3.—A schematic diagram of a fan skirt (S) that merges along its lower boundary with a basin floor (BF). What formed the fan skirt were coalescing alluvial fans originating at gullies cut in a dissected fan piedmont (P) and debouching inset fans (I) of the fan piedmont. The erosional fan piedmont remnants and mouths of the inset fans form the upper boundary of the fan skirt. The fan skirt is the same age surface as the inset fans but is younger than the relict summits of the fan remnants. It may be the same age or younger than the basin-floor surface but, as shown here, is younger because alluvium of the fan skirt overlaps the basin-floor surface.**

the individual soil components are on the landscape. While landforms and soils are related, they are not mutually exclusive. Individual soil series commonly occur on more than one component landform.

In this survey area, the landforms are classified and defined according to Peterson (22). The landform elements are described and defined in a manner precise enough for one to visualize where soils occur in relation to each other. The intent of this section is not to define all of the landform terms but to briefly define the main geomorphic surfaces in the survey area. All landform terms are defined in the Glossary.

The landforms of the intermontane basins are first grouped into two general classes, bolson (fig. 1) and semibolson (fig. 2). Within these two groups are three major physiographic parts identified in the Basin and Range Province (fig. 3). These are the bounding mountains, the piedmont slope, and the basin floor. The bounding mountains are not well defined; the slope components are identified and the hills are separated

from the mountains. The definition of a hill is a highland mass that rises less than 1,000 feet above the surrounding boundaries. The piedmont slope and basin floor are gross topographic forms that slope from the bounding mountains down to a central playa.

The shapes, genetic relationships, and geographic scales of the topography seen in the field are used to classify the landforms. The two general classes, bolson and semibolson, are successively divided into smaller and genetically more homogeneous classes (charts 1 and 2). The broadest class is major physiographic parts, each of which is made up of several genetically related major landforms. They in turn may be comprised of several more genetically related component landforms. The component landforms are about the smallest single units that one would consider in combined terms of their form, constituent materials, and genetic history. Some component landforms, such as fan piedmont remnants, have distinctive topographic parts with quite different geomorphic histories. The

CHART 1.—CLASSIFICATION OF BOLSON LANDFORMS

| Landforms                            |                      |                                              | Parts of landforms                         |                                                     |
|--------------------------------------|----------------------|----------------------------------------------|--------------------------------------------|-----------------------------------------------------|
| I<br>Major<br>physiographic part     | II<br>Major landform | III<br>Component landform                    | IV<br>Landform element                     | V<br>Slope component                                |
| Bounding mountains<br>Piedmont slope | Mountain valley fan  | Erosional fan remnant                        | Summit                                     |                                                     |
|                                      |                      |                                              | Side slope .....                           | Shoulder slope<br>Back slope<br>Foot slope          |
|                                      |                      |                                              | Partial ballena .....                      | Crest<br>Shoulder slope<br>Back slope<br>Foot slope |
|                                      | Rock pediment        | Inset fan                                    | Channel<br>Channel                         |                                                     |
|                                      |                      | Rock pediment remnant                        | Summit .....                               | Crest                                               |
|                                      |                      | Side slope .....                             | Shoulder slope<br>Back slope<br>Foot slope |                                                     |
|                                      | Ballena .....        |                                              | Channel                                    |                                                     |
|                                      |                      |                                              |                                            | Crest<br>Shoulder slope<br>Back slope<br>Foot slope |
|                                      |                      |                                              |                                            |                                                     |
|                                      | Alluvial fan         | Inset fan                                    | Channel<br>Channel                         |                                                     |
| Fan collar<br>Erosional fan remnant  |                      | Channel<br>Summit                            |                                            |                                                     |
| Side slope .....                     |                      | Shoulder slope<br>Back slope<br>Foot slope   |                                            |                                                     |
| Basin floor (bolson<br>floor)        | Fan piedmont         | Erosional fan remnant                        | Partial ballena .....                      | Crest<br>Shoulder slope<br>Back slope<br>Foot slope |
|                                      |                      |                                              | Channel<br>Channel                         |                                                     |
|                                      |                      |                                              | Summit<br>Side slope .....                 | Shoulder slope<br>Back slope<br>Foot slope          |
|                                      | Fan skirt .....      | Inset fan                                    | Channel<br>Channel<br>Channel<br>Channel   |                                                     |
|                                      |                      | Beach terrace                                | Channel                                    |                                                     |
|                                      |                      | Beach terrace                                |                                            | Crest<br>Shoulder slope<br>Back slope               |
|                                      | Alluvial flat        | Relict alluvial flat<br>Recent alluvial flat | Channel<br>Channel                         |                                                     |
|                                      |                      | Alluvial plain                               |                                            |                                                     |
|                                      |                      | Sand sheet                                   | Sand dune (Parna<br>dune)                  | Interdune flat                                      |
|                                      | Lake plain<br>Playa  | Lake plain terrace                           | Channel                                    |                                                     |
| Flood plain playa                    |                      | Channel                                      |                                            |                                                     |



CHART 2.—CLASSIFICATION OF SEMIBOLSON LANDFORMS

| Landforms                            |                      |                           | Parts of landforms     |                                                     |
|--------------------------------------|----------------------|---------------------------|------------------------|-----------------------------------------------------|
| I<br>Major<br>physiographic part     | II<br>Major landform | III<br>Component landform | IV<br>Landform element | V<br>Slope component                                |
| Bounding mountains<br>Piedmont slope | Mountain valley fan  | Erosional fan remnant     | Summit                 |                                                     |
|                                      |                      |                           | Side slope .....       | Shoulder slope<br>Back slope<br>Foot slope          |
|                                      |                      |                           | Partial ballena .....  | Crest<br>Shoulder slope<br>Back slope<br>Foot slope |
|                                      | Rock pediment        | Inset fan                 | Channel                |                                                     |
|                                      |                      | Rock pediment remnant     | Summit .....           | Crest                                               |
|                                      |                      |                           | Side slope .....       | Shoulder slope<br>Back slope<br>Foot slope          |
|                                      | Ballena .....        |                           | Channel                |                                                     |
|                                      |                      |                           |                        | Crest<br>Shoulder slope<br>Back slope<br>Foot slope |
|                                      | Alluvial fan         | Inset fan                 | Channel                |                                                     |
|                                      |                      | Fan collar                | Channel                |                                                     |
|                                      |                      | Erosion fan remnant       | Summit                 |                                                     |
|                                      |                      |                           | Side slope .....       | Shoulder slope<br>Back slope<br>Foot slope          |
|                                      | Fan piedmont         |                           | Partial ballena .....  | Crest<br>Shoulder slope<br>Back slope<br>Foot slope |
|                                      |                      | Inset fan                 | Channel                |                                                     |
|                                      |                      | Erosional fan remnant     | Summit                 |                                                     |
|                                      |                      |                           | Side slope .....       | Shoulder slope<br>Back slope<br>Foot slope          |
|                                      | Pediment             |                           | Partial ballena .....  | Crest<br>Shoulder slope<br>Back slope<br>Foot slope |
|                                      |                      | Inset fan                 | Channel                |                                                     |
|                                      |                      | Fan apron                 | Channel                |                                                     |
|                                      |                      | Nonburied fan remnant     | Channel                |                                                     |
|                                      | Fan skirt .....      | Pediment remnant          | Summit                 |                                                     |
|                                      |                      |                           | Side slope .....       | Shoulder slope<br>Back slope<br>Foot slope          |
|                                      |                      |                           | Channel                |                                                     |
|                                      |                      |                           | Channel                |                                                     |

CHART 2.—CLASSIFICATION OF SEMIBOLSON LANDFORMS—Continued

| Landforms                         |                           |                                                      | Parts of landforms                    |                                                     |
|-----------------------------------|---------------------------|------------------------------------------------------|---------------------------------------|-----------------------------------------------------|
| I<br>Major<br>physiographic part  | II<br>Major landform      | III<br>Component landform                            | IV<br>Landform element                | V<br>Slope component                                |
| Basin floor<br>(semibolson floor) | Alluvial flat             | Relict alluvial flat<br>Recent alluvial flat         | Channel<br>Channel                    |                                                     |
|                                   | Alluvial plain            |                                                      | Summit                                |                                                     |
|                                   | Basin-floor remnant ..... |                                                      | Side slope .....                      | Shoulder slope<br>Back slope<br>Foot slope          |
|                                   |                           |                                                      | Partial ballena .....                 | Crest<br>Shoulder slope<br>Back slope<br>Foot slope |
|                                   |                           |                                                      | Channel<br>Channel                    |                                                     |
|                                   | Sand sheet                | Inset fan<br>Sand dune                               |                                       |                                                     |
|                                   | Axial-stream flood plain  | Flood plain playa<br>Stream terrace<br>River terrace | Channel<br>Summit<br>Side slope ..... | Shoulder slope<br>Back slope<br>Foot slope          |

fourth class, landform elements, recognizes these parts. The fifth class, slope components, includes those landform elements that are erosional surfaces to be subdivided into their genetic components.

For soil survey applications, it would be most convenient if somewhere in the hierarchy the landform classes corresponded to individual soils. The very purposes of a landform classification, however, prevent such classes being gathered in a single category.

In the section "General Soil Map Units," landscape

positions are given for each major component. These generally are major physiographic parts, major landforms, or component landforms. In the section "Detailed Soil Map Units," broad landscape positions are given for each map unit in the map unit setting. These are major physiographic parts or major landforms. More detailed landscape positions are given for each major component and contrasting inclusion. These generally are component landforms, landform elements, or slope components.



# General Soil Map Units

---

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The soils or miscellaneous areas making up one unit can occur in other units but in a different pattern.

A perspective of how the general soil map units relate to the various broad landscapes is illustrated in figures 4 and 5. The map units in figure 4 are representative of those on a bolson that is an internally drained intermontane basin. The map units in figure 5 are representative of those on a semibolson that is an externally drained intermontane basin.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils or miscellaneous areas can be identified on the map. Likewise, areas that are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The 22 general map units in this survey have been grouped into four general kinds of landscape for broad interpretive purposes. Each of the broad groups and the map units in each group are described in the following pages.

## Map Unit Descriptions

### Areas Dominated by Soils on Bolson and Semibolson Floors

There are five map units in this group. The soils and miscellaneous areas in the group are dominantly on basin floors, axial stream flood plains, alluvial flats, lake plains, and their remnants (22). Elevations range from

4,450 feet in the northern part of the survey area to 5,700 feet in the southern part. The average annual precipitation is 5 to 8 inches, the average annual air temperature is 46 to 52 degrees F, and the frost-free season is 100 to 120 days.

The soils in this group are level to gently sloping and very deep and have dominantly stratified silty textured profiles. Most of the soils are salt and sodium affected to some degree.

The soils form drainage catenas across the valley floors. The poorly drained, frequently flooded soils exhibit little or no profile development and are on the youngest, actively aggrading geomorphic surfaces. The somewhat poorly drained, occasionally flooded soils exhibit minimal profile development. They are on young, semistable geomorphic surfaces. The moderately well drained and well drained, nonflooded soils exhibit limited profile development and are on slightly older, yet still Holocene, stable geomorphic surfaces.

#### 1. Playas

This map unit occurs on level basin floors in the sink areas of Buffalo and Grass Valleys. The areas are barren of vegetation. Water is ponded in these areas in the spring of most years following spring runoff.

This map unit makes up about 1 percent of the survey area.

This miscellaneous area consists of nearly impermeable lacustrine sediments with a veneer of eolian sand.

This map unit is not suited to most uses.

#### 2. Wendane-Gund-Batan

*Level and nearly level, very deep, somewhat poorly drained and moderately well drained soils on alluvial flats, alluvial flat remnants, lake plains, and lake plain terraces*

This map unit is in the lower part of Grass Valley bordering the playa. The vegetation is mainly basin wildrye, alkali bluegrass, inland saltgrass, black greasewood, and rubber rabbitbrush on Wendane soils;

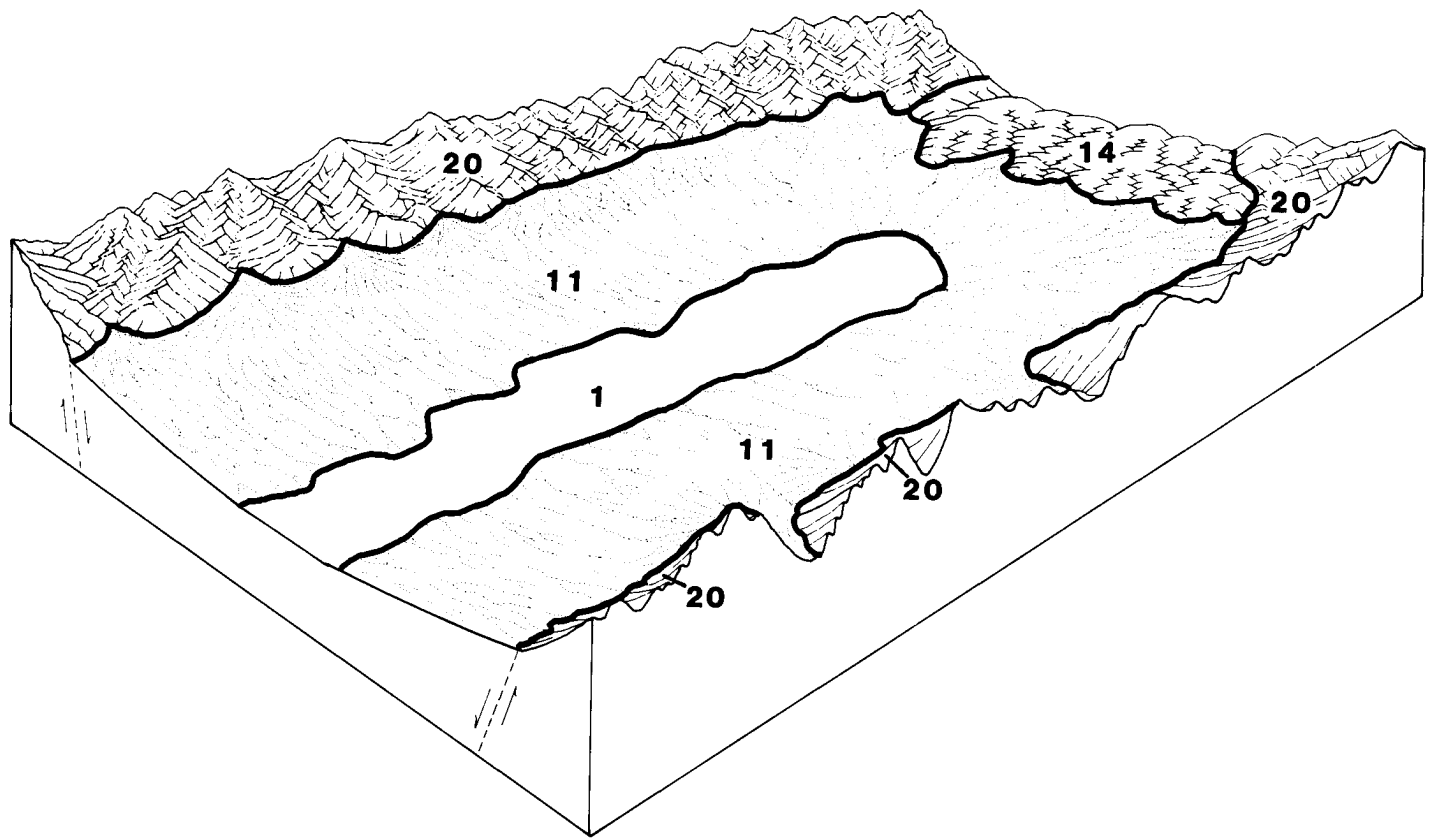


Figure 4.—Typical relationship of general soil map units and landscapes: Playas (1); Buffaran-Allor-Chiara (11); Puett-Wieland-Genaw (14); and Itca-Reluctan-Punchbowl (20).

basin wildrye, black greasewood, and basin big sagebrush on Gund soils; and bottlebrush squirreltail, shadscale, bud sagebrush, and black greasewood on Batan soils.

This map unit makes up about 1 percent of the survey area.

The Wendane series consists of somewhat poorly drained soils on alluvial flats and lake plains. These soils have a thin, light-colored surface layer and are dominantly stratified medium textured and moderately fine textured throughout the profile. They are strongly salt and sodium affected. They are subject to common flooding.

The Gund series consists of somewhat poorly drained soils on lake plain terraces. These soils have a thin, light-colored, medium textured surface layer and a profile that is dominantly medium textured and moderately fine textured in the upper part and fine textured lake sediments in the lower part. They are strongly salt and sodium affected. They are subject to rare flooding.

The Batan series consists of moderately well drained soils on alluvial flat remnants. These soils have a thin, light-colored surface layer and are dominantly stratified medium textured and moderately fine textured throughout the profile. They are strongly salt and sodium affected. These soils are not subject to flooding.

Of minor extent in this unit are McConnel and Tulase soils. McConnel soils are somewhat excessively drained, stratified, very gravelly and extremely gravelly, moderately coarse textured soils on offshore bars. They support Thurber needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush. Tulase soils are well drained, medium textured soils in lagoons. They support Thurber needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush. These soils are not salt or sodium affected and are not subject to flooding.

This unit is used for livestock grazing and wildlife habitat. The main limitations are the strongly salt- and sodium-affected soil profiles and the low average annual precipitation.

### 3. Sonoma-Rixie-Paranat

*Level and nearly level, very deep, poorly drained soils on axial stream flood plains*

This map unit is in the north part of the survey area along the Humboldt River meander belt. The vegetation is mainly basin wildrye, creeping wildrye, and sedges and small areas of alkali sacaton, alkali bluegrass, and inland saltgrass. Flooding by the Humboldt River is common and occurs at least one or more springs in five for a duration of 2 days to 1 month.

This map unit makes up about 3 percent of the survey area.

The Sonoma soils have a thick surface layer and are dominantly stratified medium textured and moderately fine textured throughout the profile. These soils are salt free or slightly salt and sodium affected in the surface

layer but are not salt or sodium affected throughout the rest of the profile.

The Rixie soils have a thick, dark colored surface layer and are dominantly stratified medium textured and moderately fine textured throughout the profile. These soils are not salt or sodium affected.

The Paranat soils have a thick, dark colored surface layer and are dominantly stratified medium textured and moderately fine textured throughout the profile. These soils are not salt or sodium affected.

Of minor extent in this map unit are Ocala, Batan, and Rose Creek soils. Ocala soils are somewhat poorly drained, subject to occasional flooding, and medium textured. They are on alluvial flats. They are strongly salt and sodium affected and support basin wildrye and black greasewood. Batan soils are moderately well drained, not subject to flooding, and medium textured.

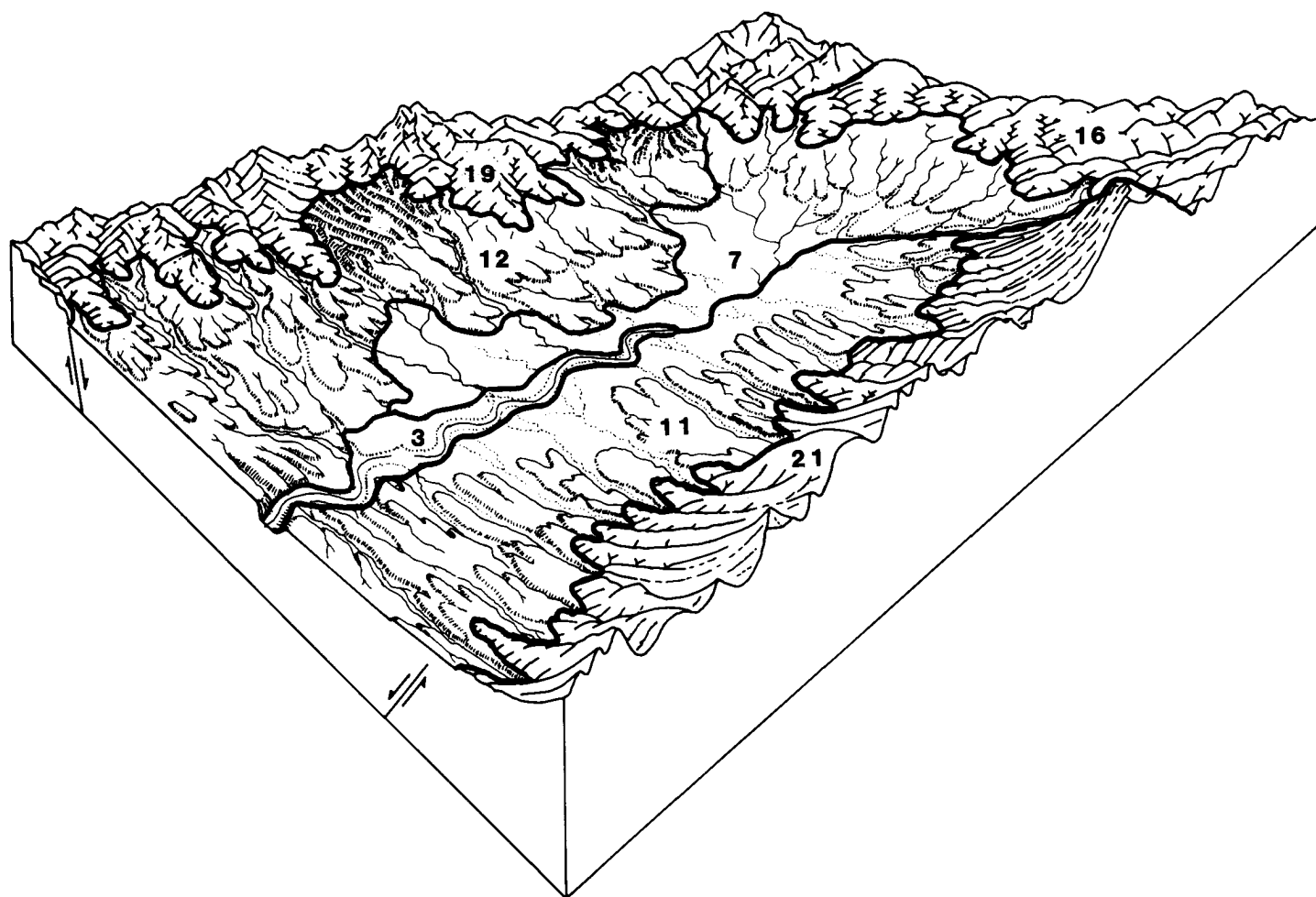


Figure 5.—Typical relationship of general soil map units and landscapes: Sonoma-Rixie-Paranat (3); Orovada-Broyles-Shabliss (7); Buffaran-Allor-Chiara (11); Bioya-Chiara-Cortez (12); Robson-Akerue-Buffaran (16); Sumine-Chen-Rock outcrop (19); and Quarz-Walti-Glean (21).

They are on alluvial flat remnants. They are strongly salt and sodium affected and support bottlebrush squirreltail, black greasewood, and shadscale. Rose Creek soils are somewhat poorly drained, subject to occasional flooding, and medium textured. They are in high flood plain positions. They are strongly salt and slightly sodium affected and support basin wildrye, streambank wheatgrass, and big sagebrush.

This map unit is used for meadow hay, winter grazing, and wildlife habitat. If irrigation water is available, this unit is suitable for native hay or improved pasture. It is moderately suitable for irrigated cropland, livestock grazing, and wildlife habitat. The main limitations are the flooding and seasonal high water table.

This unit is poorly suited to homesite development because of flooding, the seasonal high water table, low bearing strength, and slow percolation rate.

#### 4. Wendane-Batan-Bubus

*Level and nearly level, very deep, somewhat poorly drained, moderately well drained, and well drained soils on alluvial flats and alluvial flat remnants*

This map unit is on broad valley bottoms in the Buffalo, Carico, Crescent, and Reese River Valleys. The vegetation is mainly basin wildrye, black greasewood, and rubber rabbitbrush on Wendane soils and bottlebrush squirreltail, black greasewood, and shadscale on Batan soils.

This map unit makes up about 11 percent of the survey area.

The Wendane series consists of somewhat poorly drained soils on alluvial flats. These soils have a thin, light-colored surface layer and are dominantly stratified medium textured and moderately fine textured throughout the profile. They are strongly salt and sodium affected. These soils are subject to common flooding during 1 or more years in 10 for a period of 2 days to 1 month or will pond water for long periods.

The Batan series consists of moderately well drained soils on alluvial flat remnants. These soils have a thin, light-colored surface layer and are dominantly stratified medium textured and moderately fine textured throughout the profile. They are strongly salt and sodium affected. Some of these soils are subject to common flooding at least 1 year in 10 for a period of 2 days to 1 month or will pond water for long periods.

The Bubus series consists of well drained soils on alluvial flat remnants. These soils have a thin, light-colored surface layer and are dominantly stratified, moderately coarse textured and medium textured throughout the profile. They are strongly salt and sodium affected. These soils are not subject to flooding.

Of minor extent in this map unit are Reese and Broyles soils. Reese soils are poorly drained, subject to occasional flooding, and moderately fine textured. They are on flood plain remnants or drainage channels. They are strongly salt and sodium affected and support basin wildrye and black greasewood. Broyles soils are well drained, not subject to flooding, and moderately coarse textured. They are on fan skirts. They are salt free to slightly salt affected in the upper part of the profile and slightly to strongly salt and sodium affected in the lower profile and support bottlebrush squirreltail and shadscale.

This map unit is used for livestock grazing, wildlife habitat, irrigated cropland, and homesite development. The main limitations to use for livestock grazing and as wildlife habitat are the low average annual precipitation and the strongly salt- and sodium-affected soil profiles.

Batan and Bubus soils are suitable for crops, pasture, and hay, if irrigation water is available and reclamation practices are used. Batan soils are poorly suited to homesite development; the main limitations are the slow percolation rates and low bearing strength. Bubus soils are moderately suited to homesite development; the main limitation is the moderate percolation rate in the substratum.

#### 5. Tweba-Wendane

*Level to gently sloping, very deep, somewhat poorly drained and moderately well drained soils on axial stream flood plains and alluvial flats*

This map unit is in the north part of the survey area along Rock Creek. The vegetation is mainly basin wildrye, basin big sagebrush, and black greasewood on Tweba soils and basin wildrye and black greasewood on Wendane soils.

This map unit makes up less than 1 percent of the survey area.

The Tweba series consists of nearly level to gently sloping soils on incised axial stream flood plains. Stream channel entrenchment has altered the drainage to moderately well drained. These soils have a thin surface layer and dominantly stratified, moderately coarse textured and medium textured profiles. They are not salt or sodium affected. These soils are subject to rare flooding.

The Wendane series consists of somewhat poorly drained soils on nearly level alluvial flats. These soils have a thin, light-colored surface layer and are dominantly stratified medium textured and moderately fine textured throughout the profile. They are strongly salt and sodium affected. These soils are subject to occasional flooding.

Of minor extent in this unit are Doowak and Orovada

soils. Doowak soils are somewhat excessively drained, very gravelly coarse textured soils on gently sloping inset fans. They support basin wildrye, basin big sagebrush, and black greasewood. Orovada soils are well drained, moderately coarse textured and medium textured soils on nearly level fan skirts. These soils support Thurber needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush. They are not salt or sodium affected or subject to flooding.

This unit is used for livestock grazing and wildlife habitat.

### **Areas Dominated by Soils on Fan Piedmonts and Fan Skirts**

Seven map units are in this group. The soils in this group are dominantly on fan piedmonts and fan skirts. Elevations range from 4,600 feet in the northern part of the survey area to 6,400 feet in the southern part. The average annual precipitation is 7 to 10 inches, the average annual air temperature is 46 to 52 degrees F, and the frost-free season is 100 to 120 days.

These soils are nearly level to moderately steep and well drained. They are shallow or moderately deep over a hardpan or are very deep. These soils typically are not subject to flooding. Soils in the lower precipitation areas are salt and sodium affected to some degree.

Some of the soils are young (Holocene age) and exhibit leaching of carbonates and some weak silica cementation or durinodes. The older (Wisconsinan age) soils have horizons of clay accumulation over horizons with variable amounts of silica cementation. A few soils are very old (pre-Wisconsinan age) and have thick horizons of clay accumulation over indurated duripans. Erosion has truncated the profile of some of the very old soils, leaving only a remnant hardpan and new soils forming in the younger material overplacing the relict hardpan.

### **6. Broyles-Creemon-Wholan**

*Nearly level and gently sloping, very deep, well drained soils on fan skirts and inset fans*

This map unit is in the Antelope, Carico, Crescent, Grass, and Reese River Valleys. The vegetation is mainly bottlebrush squirreltail, Indian ricegrass, shadscale, and bud sagebrush on the Broyles and Creemon soils and bottlebrush squirreltail and winterfat on the Wholan soil.

This map unit makes up about 8 percent of the survey area.

The Broyles series consists of nearly level to gently sloping soils on the highest fan skirts bordering the fan piedmont remnants. These soils have a thin, light-colored, medium textured surface layer and dominantly

stratified, moderately coarse textured and medium textured subsoil and substratum. They have a salt- and sodium-free or slightly salt- and sodium-affected surface layer and subsoil and a slightly to moderately salt-affected and moderately to strongly sodium-affected substratum.

The Creemon series consists of nearly level soils on fan skirts near the high areas of drainage basins. These soils have a thin, light-colored, medium textured surface layer and a dominantly medium textured subsoil and substratum. The substratum is moderately salt and slightly sodium affected.

The Wholan series consists of nearly level soils on inset fans that shallowly dissect fan skirts and alluvial plains. These soils have a thin, light-colored, medium textured surface layer and a dominantly medium textured subsoil and substratum. They are not salt and sodium affected.

Of minor extent in this map unit are Orovada, Relley, and Misad soils. Orovada soils are medium textured and on nearly level to moderately sloping fan skirts that receive additional soil moisture from runoff. They have a slightly salt- and sodium-affected substratum and support Thurber needlegrass, bottlebrush squirreltail, and Wyoming big sagebrush. Relley soils are medium textured on nearly level fan skirts. They have a moderately salt- and slightly sodium-affected substratum and support bottlebrush squirreltail and shadscale. Misad soils are very gravelly, moderately coarse textured, and on nearly level to gently sloping inset fans. They have moderately to strongly salt-affected and moderately sodium-affected profiles and support bottlebrush squirreltail, black greasewood, and shadscale.

This map unit is used for livestock grazing, wildlife habitat, irrigated cropland, and homesite development. The main limitation is the low average annual precipitation. This map unit is suited to crops, pasture, and hay if an adequate, dependable water supply is available.

This unit is moderately suited to homesite development.

### **7. Orovada-Broyles-Shabliss**

*Nearly level to moderately steep, shallow or very deep, well drained soils on fan aprons, fan skirts, and fan piedmont remnants*

This map unit is in the northern part of the survey area north of the Humboldt River and west of the Sheep Creek Range.

The vegetation is mainly bluebunch wheatgrass, Thurber needlegrass, and Wyoming big sagebrush on Orovada and Shabliss soils and bottlebrush squirreltail,



Indian ricegrass, shadscale, and bud sagebrush on Broyles soils.

This map unit makes up about 3 percent of the survey area.

The Orovada series consists of very deep soils on gently sloping to moderately sloping fan aprons and upper fan skirts. These soils have a thin, moderately coarse textured surface layer and a dominantly stratified, moderately coarse textured and medium textured subsoil and substratum. They have a slightly or moderately salt-affected substratum.

The Broyles series consists of very deep soils on nearly level to moderately sloping, lower fan skirts bordering the Humboldt River meander belt. These soils have a thin, light-colored, medium textured surface layer and a dominantly stratified moderately coarse textured and medium textured subsoil and substratum. They have a slightly to moderately salt-affected and moderately to strongly sodium-affected substratum.

The Shabliss series consists of shallow soils on moderately steep, nonburied, erosional side slopes of fan piedmont remnants. These soils have a thin, medium textured surface layer and a medium textured subsoil over a strongly silica-cemented hardpan. These soils are not salt affected.

Of minor extent in this unit are Goldrun and Blackhawk soils. Goldrun soils are very deep, excessively drained, coarse textured soils on nearly level to gently sloping sand sheets and semistabilized dunes. They support western wheatgrass, Indian ricegrass, and big sagebrush. Blackhawk soils are shallow, well drained soils on gently sloping to moderately sloping erosional fan piedmont remnants. They have a medium textured profile over a strongly silica-cemented hardpan and support bottlebrush squirreltail, shadscale, and bud sagebrush.

This map unit is used for livestock grazing, wildlife habitat, and irrigated cropland.

## 8. Beoska-Broyles-Whirlo

*Nearly level to moderately sloping, very deep, well drained soils on fan piedmont remnants, fan skirts, and inset fans*

This map unit borders the mountains flanking the Carico Lake and Reese River Valleys and the southern side of Buffalo Valley. The vegetation is bottlebrush squirreltail, shadscale, and bud sagebrush.

This map unit makes up about 12 percent of the survey area.

The Beoska series consists of gently sloping to moderately sloping soils on fan piedmont remnants. These soils have a thin, light-colored, medium textured surface layer; a medium to moderately fine textured

subsoil; and a gravelly, moderately coarse to medium textured substratum. They have a moderately salt-affected and slightly sodium-affected subsoil and a strongly salt- and sodium-affected substratum.

The Broyles series consists of nearly level to moderately sloping soils on fan skirts. These soils have a thin, light-colored, medium textured surface layer and a moderately coarse and medium textured subsoil and substratum. They have a slightly salt-affected surface layer and subsoil and a moderately salt- and slightly sodium-affected substratum.

The Whirlo series consists of nearly level to gently sloping soils on inset fans. These soils have a thin, light-colored, medium textured surface layer and very gravelly, moderately coarse textured subsoil and substratum. They have a slightly salt-affected subsoil and a moderately salt- and slightly sodium-affected substratum.

Of minor extent in this unit are Kingingham, Wholan, and Orovada soils. Kingingham soils are moderately deep, well drained soils on erosional fan piedmont remnants. They have a fine textured, sodium-affected subsoil over an indurated duripan and support bottlebrush squirreltail, shadscale, and bud sagebrush. Wholan soils are very deep, well drained, subject to rare or occasional flooding, medium textured, and on nearly level, slightly convex inset fans. They are not salt or sodium affected and support Indian ricegrass and winterfat. Orovada soils are very deep, well drained, subject to rare flooding, medium textured, and on gently sloping to moderately sloping fan aprons. They are not salt or sodium affected and support Thurber needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush.

This unit is used for livestock grazing and wildlife habitat. The main limitation is the low average annual precipitation. On Kingingham soils, the moderately salt- and slightly sodium-affected subsoil also is a limitation.

## 9. Ricert-Orovada-Tenabo

*Nearly level to moderately sloping, shallow and very deep, well drained soils on fan piedmont remnants and fan skirts*

This map unit flanks the mountains along the north sides of Buffalo and Crescent Valleys and extends from the mountains to the edge of the semibolson of Antelope Valley. The vegetation is mainly bottlebrush squirreltail, Indian ricegrass, shadscale, and bud sagebrush.

This map unit makes up about 8 percent of the survey area.

The Ricert series consists of very deep soils on gently sloping to moderately sloping, lower fan

piedmont remnants. These soils have a thin, light-colored, medium textured surface layer; a fine textured subsoil; and a very gravelly, moderately coarse textured substratum. They have a moderately sodium-affected subsoil and a slightly salt- and strongly sodium-affected substratum.

The Orovada series consists of very deep soils on nearly level to moderately sloping fan skirts. These soils have a thin, light-colored, medium textured surface layer and a very gravelly, moderately coarse textured subsoil and substratum. They have a slightly salt-affected subsoil and a moderately salt- and slightly sodium-affected substratum.

The Tenabo series consists of shallow soils on nearly level to gently sloping, higher, erosional fan piedmont remnants. These soils have a thin, light-colored, medium textured surface layer and a moderately fine textured subsoil over an indurated hardpan. They have a slightly to moderately sodium-affected subsoil.

Of minor extent in this unit are Broyles and Batan soils. Broyles soils are very deep, well drained, medium textured soils on nearly level to gently sloping inset fans and fan skirt margins. They have a slightly salt- and sodium-affected surface layer and subsoil and a slightly to moderately salt-affected and moderately to strongly sodium-affected substratum and support bottlebrush squirreltail, Indian ricegrass, and shadscale. Batan soils are very deep, moderately well drained, medium to moderately fine textured, and on nearly level alluvial flat remnants. They have strongly salt- and sodium-affected profiles and support bottlebrush squirreltail, shadscale, and black greasewood. These soils are not subject to flooding.

This map unit is used for livestock grazing and as wildlife habitat. The main limitations are the low average annual precipitation and the salt- and sodium-affected surface layer and subsoil.

#### 10. Bouflat-Orovada

*Gently sloping and moderately sloping, moderately deep and very deep, well drained soils on fan piedmont remnants and fan skirts*

This map unit is located on the north boundary of the survey area flanking both sides of the Rock Creek flood plain. The vegetation is mainly bluebunch wheatgrass, Thurber needlegrass, and Wyoming big sagebrush.

This map unit makes up about 2 percent of the survey area.

The Bouflat series consists of moderately deep soils on gently sloping to moderately sloping fan piedmont remnants. These soils have a thin, medium textured surface layer and a medium to moderately fine textured

subsoil over a strongly silica-cemented hardpan. These soils are not salt or sodium affected.

The Orovada series consists of very deep soils on gently sloping to moderately sloping fan skirts. These soils have a thin, medium textured surface layer and a moderately coarse and medium textured subsoil and substratum. They have a slightly salt- and sodium-affected substratum.

Of minor extent in this unit are Goldrun, Blacka, and Blackhawk soils. Goldrun soils are very deep, excessively drained, coarse textured, and on gently sloping to moderately sloping sand sheets and semistabilized dunes. They support western wheatgrass, Indian ricegrass, and big sagebrush. Blacka and Blackhawk soils are moderately deep, well drained soils on strongly sloping, erosional fan piedmont remnants. They have a moderately coarse textured profile over a strongly silica-cemented hardpan and support bluebunch wheatgrass, Thurber needlegrass, and Wyoming big sagebrush. These soils are not salt or sodium affected.

This map unit is used for livestock grazing and as wildlife habitat. The main limitation is the moderately low average annual precipitation.

#### 11. Buffaran-Allor-Chiara

*Gently sloping to strongly sloping, shallow and very deep, well drained soils on fan piedmont remnants and fan skirts*

This map unit flanks the Toiyabe Range in Carico and Grass Valleys and the west side of the Sheep Creek Range along the Humboldt River Valley. The vegetation is mainly bluebunch wheatgrass, Thurber needlegrass, and Wyoming big sagebrush.

This map unit makes up about 5 percent of the survey area.

The Buffaran series consists of shallow soils on gently sloping to moderately sloping, higher erosional fan piedmont remnants. These soils have a thin, light-colored, stony, medium textured surface layer and a fine textured subsoil over an indurated hardpan. They are not salt or sodium affected.

The Allor series consists of very deep soils on gently sloping to strongly sloping, broad fan piedmont remnants. These soils have a thin, gravelly, medium textured surface layer; a gravelly, fine textured subsoil; and a gravelly, moderately coarse and medium textured substratum. They are not salt or sodium affected.

The Chiara series consists of very deep soils on gently sloping to moderately sloping fan skirts. These soils have a thin, moderately coarse textured surface layer and a dominantly stratified, moderately coarse and

medium textured subsoil and substratum. They have a slightly to moderately salt-affected substratum.

Of minor extent in this map unit are Whirlo and Ricert soils. Whirlo soils are very deep, very gravelly, moderately coarse and medium textured soils on nearly level to gently sloping, lower inset fans and fan skirts. They have a slightly salt-affected subsoil and a moderately salt- and slightly sodium-affected substratum. Ricert soils are very deep, medium and moderately fine textured, and on nearly level to gently sloping lower fan piedmont remnants. They have a moderately salt-affected and a moderately to strongly sodium-affected subsoil and substratum. Both of these soils support bottlebrush squirreltail, shadscale, and bud sagebrush.

This map unit is used for livestock grazing and as wildlife habitat.

## 12. Bioya-Chiara-Cortez

*Gently sloping to strongly sloping, shallow and moderately deep, well drained soils on fan piedmont remnants*

This map unit is in the north part of the survey area on the broad Sheep Creek Range plateau. The vegetation is mainly bluebunch wheatgrass, Thurber needlegrass, and Wyoming big sagebrush.

This map unit makes up about 3 percent of the survey area.

The Bioya series consists of moderately deep soils on gently sloping to moderately sloping, lower fan piedmont remnants. These soils have a thin, medium textured surface layer and medium textured subsoil over an indurated hardpan. They are not salt or sodium affected.

The Chiara series consists of shallow soils on gently sloping to moderately sloping, higher fan piedmont remnants. These soils have a thin, medium textured surface layer and a medium textured subsoil over an indurated hardpan. They are not salt or sodium affected.

The Cortez series consists of moderately deep soils on strongly sloping side slopes of fan piedmont remnants. These soils have a thin, light-colored, medium textured surface layer and a fine textured subsoil over an indurated hardpan. The subsoil is moderately sodium affected.

Of minor extent in this map unit are Alley, Trunk, and Orovada soils. These soils support plant communities similar to those on the major soils and are not salt or sodium affected. Alley soils are very deep, moderately fine textured soils. Trunk soils are deep, fine textured soils. These soils are on steep and very steep plateau side slopes near the boundary of the Tuscarora soil

survey area. Orovada soils are very deep, moderately coarse textured, and on gently sloping fan aprons.

This map unit is used for livestock grazing and as wildlife habitat. The main limitations are the moderately low average annual precipitation and the moderate water-supplying capacity of the soil profile. On Cortez soils, the sodium-affected subsoil is a limitation.

## Areas Dominated by Soils on Foothills and Low Mountains

Six map units are in this group. The soils in this group are dominantly on foothills and low mountains. Elevations range from 4,800 feet at the base of foothills in the northern part of the survey to 8,600 feet on peaks in the low mountains in the southern part. The average annual precipitation is 7 to 12 inches, the average annual air temperature is 42 to 49 degrees F, and the frost-free season is 80 to 110 days.

These soils are gently sloping to very steep and well drained. They are shallow or moderately deep over a hardpan or bedrock or the soils are very deep. These soils are not subject to flooding and are not salt or sodium affected.

Some of the soils are young (Holocene aged) and exhibit either no soil profile development or only a minimal amount of carbonate leaching. The surface of these soils has been severely eroded. The older (Wisconsinan aged) soils have horizons of clay accumulation over horizons that have variable amounts of silica cementation. A few soils are very old (pre-Wisconsinan aged) and have thick horizons of clay accumulation over indurated duripans.

## 13. McVegas-Stingdorn-Old Camp

*Gently sloping to steep, shallow, well drained soils on foothills*

This map unit is on the dry foothills on the north and east sides of the Fish Creek Range and on small isolated hills in the Antelope and Reese River Valleys. The vegetation is mainly bottlebrush squirreltail, Indian ricegrass, and shadscale on McVegas and Stingdorn soils and bluebunch wheatgrass, Thurber needlegrass, and Wyoming big sagebrush on Old Camp soils.

This map unit makes up about 2 percent of the survey area.

The McVegas series consists of shallow soils on moderately steep, concave, south-facing side slopes of foothills. These soils have a thin, light-colored, very cobbly, medium textured surface layer and a very cobbly, fine textured subsoil over a strongly silica-cemented hardpan capping hard bedrock. The subsoil is slightly salt affected and moderately to strongly sodium affected.

The Stingdorn series consists of shallow soils on gently sloping to steep, rounded summits and side slopes of foothills. These soils have a thin, light-colored, very cobbly, medium textured surface layer and a very cobbly, moderately fine textured subsoil over an indurated hardpan capping hard bedrock. They are not salt or sodium affected.

The Old Camp series consists of shallow soils on moderately steep to steep, concave, north-facing side slopes on foothills. These soils have a thin, light-colored, very gravelly or cobbly, medium textured surface layer and a very gravelly, moderately fine textured subsoil over hard bedrock. They are not salt or sodium affected.

Of minor extent in this map unit are Bojo, Genaw, and Minat soils. Bojo soils are shallow, medium to moderately fine textured soils over hard bedrock. They are on gently sloping to moderately sloping summits of foothills. Genaw soils are shallow, medium to moderately fine textured soils over soft Tertiary sediments. They are on moderately sloping foothill summits. Minat soils are very deep, very gravelly, medium textured soils on steep, colluvial, foothill side slopes. These soils are not salt or sodium affected and support Thurber needlegrass, spiny hopsage, and Wyoming big sagebrush.

This map unit is used for livestock grazing and as wildlife habitat. The main limitations are the surface rock fragments and droughty soil profiles. On McVegas soils, the sodium-affected subsoil is also a limitation.

#### 14. Puett-Wieland-Genaw

*Gently sloping to strongly sloping, very deep, well drained soils on mountain valley fans and moderately steep and steep, shallow, well drained soils on low, rolling foothills*

This map unit is in the southeast part of the survey area in the Toiyabe Range. The vegetation is mainly bluebunch wheatgrass, Thurber needlegrass, and Wyoming big sagebrush and areas of Utah juniper and singleleaf pinyon pine.

This map unit makes up about 2 percent of the survey area.

The Puett series consists of shallow soils on moderately steep to steep foothill side slopes. These soils have a thin, medium textured surface layer and subsoil over soft Tertiary sedimentary rock.

The Wieland series consists of very deep soils on gently sloping to strongly sloping, mountain valley fan summits. These soils have a thin, gravelly, medium textured surface layer and a gravelly, fine textured subsoil.

The Genaw series consists of shallow soils on

moderately sloping to strongly sloping, mountain valley fan and rolling foothill shoulders and moderately steep, mountain valley fan and rolling foothill side slopes. These soils have a thin, gravelly, medium textured surface layer and a gravelly medium to moderately fine textured subsoil over soft Tertiary sedimentary rock.

Of minor extent in this unit are Zoesta and Caniwe soils. Zoesta soils are very deep, fine textured soils on moderately sloping, higher mountain valley fans. They support Thurber needlegrass, bluebunch wheatgrass, and low sagebrush. Caniwe soils are very deep, medium to moderately fine textured soils on gently sloping to moderately sloping inset fans. These soils support bluebunch wheatgrass, Thurber needlegrass, and low sagebrush.

This map unit is used for livestock grazing and as wildlife habitat.

#### 15. Tessfive-Puett-Genaw

*Strongly sloping to steep, shallow, well drained soils on foothills and low mountains*

This map unit occurs in small areas bordering Cortez Canyon, in the Fish Creek Basin, on Augusta Mountain, and in hills bordering the southwest part of Carico Lake Valley. The vegetation is mainly Indian ricegrass, Thurber needlegrass, and black sagebrush on Tessfive soils; Indian ricegrass, black sagebrush, and Wyoming big sagebrush on Puett soils; and bluebunch wheatgrass, Thurber needlegrass, and Wyoming big sagebrush on Genaw soils.

This map unit makes up about 2 percent of the survey area.

The Tessfive series consists of shallow soils on strongly sloping to moderately steep, convex rolling hill summits and shoulders and moderately steep to steep, low mountain side slopes. These soils have a thin, gravelly, medium textured surface layer and substratum over interbedded limestone and Tertiary sedimentary rock.

The Puett series consists of shallow soils on steep, eroded, rolling foothill side slopes. These soils have a thin, light-colored, medium textured surface layer and substratum over soft Tertiary sedimentary rock.

The Genaw series consists of shallow soils on strongly sloping, concave, rolling foothill summits. These soils have a thin, gravelly, medium textured surface layer and a gravelly, medium to moderately fine textured subsoil over soft Tertiary sedimentary rock.

Of minor extent in this unit are Jung, Grina, and Perlor soils. Jung soils are shallow, very gravelly, fine textured soils on rounded, moderately sloping hill shoulders. They support Indian ricegrass, Sandberg bluegrass, and black sagebrush. Grina soils are shallow

and medium textured over interbedded hard limestone and soft Tertiary sediments on concave foothill side slopes. They support Sandberg bluegrass and Utah juniper. Perlor soils are shallow, medium textured, and on lower rolling hill summits. They support Indian ricegrass, shadscale, and bud sagebrush.

This map unit is used for livestock grazing and as wildlife habitat. The main limitation is the shallow depth to bedrock resulting in droughty soil profiles.

#### 16. Robson-Akerue-Buffaran

*Moderately sloping to steep, shallow, well drained soils on foothills and low mountains*

This map unit is on the east side of Battle Mountain and the Shoshone Range near Crescent Valley. The vegetation is bluebunch wheatgrass, Indian ricegrass, low sagebrush, and black sagebrush on Robson soils and bluebunch wheatgrass, Thurber needlegrass, and Wyoming big sagebrush on Akerue and Buffaran soils.

This map unit makes up about 3 percent of the survey area.

The Robson series consists of shallow soils on strongly sloping to steep, rounded, convex, foothill and mountain side slopes. These soils have a thin, cobbly or very gravelly, medium textured surface layer and a very cobbly, fine textured subsoil over hard bedrock.

The Akerue series consists of shallow soils on moderately steep, concave, foothill and low mountain side slopes. These soils have a thin, gravelly, medium textured surface layer and a very gravelly, fine textured subsoil over a thin, indurated hardpan capping hard bedrock.

The Buffaran series consists of shallow soils on moderately sloping, short, mountain valley fans. These soils have a thin, stony, medium textured surface layer and a fine textured subsoil over a thick indurated hardpan.

Of minor extent in this unit are Humdun, Wiskan, and Havingdon soils. Humdun soils are very deep, medium textured soils on steep, concave mountain side slopes. They support bluebunch wheatgrass and Wyoming big sagebrush. Wiskan soils are moderately deep, very gravelly, fine textured soils on steep, convex mountain side slopes. They support bluebunch wheatgrass and black sagebrush. Havingdon soils are deep, very gravelly, fine textured, and on steep, convex, mountain side slopes. They support bluebunch wheatgrass and Wyoming big sagebrush.

This map unit is used for livestock grazing and as wildlife habitat. The main limitation is the droughty soil profiles because of the shallow depth to bedrock or a hardpan.

#### 17. Roca-Trunk-Alley

*Moderately sloping to very steep, moderately deep and very deep, well drained soils on foothills*

This map unit is in the north part of the survey area in the Sheep Creek Range. The vegetation is mainly bluebunch wheatgrass, Thurber needlegrass, and big sagebrush.

This map unit makes up about 2 percent of the survey area.

The Roca series consists of moderately deep soils on moderately steep to steep, upper, south-facing foothill side slopes. These soils have a thin, cobbly, medium textured surface layer and a very cobbly, fine textured subsoil over hard bedrock.

The Trunk series consists of moderately deep soils on moderately sloping to strongly sloping foothill summits and moderately steep to steep foothill side slopes on other aspects. These soils have a thin, cobbly, medium textured surface layer and a fine textured subsoil over hard bedrock.

The Alley series consists of very deep soils on very steep foothill side slopes that have mainly west-facing aspects. These soils have a thin, extremely stony, moderately coarse textured surface layer; a gravelly, moderately fine textured subsoil; and a very cobbly and gravelly, medium textured substratum.

Of minor extent in this map unit are Rock outcrop and Orovida and Goldrun soils. Rock outcrop does not have vegetation and occurs as exposed rimrock along mountain shoulders; cliffs along very steep, eroded mountain side slopes; and scattered peaks. Orovida soils are very deep, well drained, medium textured, and on moderately sloping mountain valley fans. They have similar vegetation to the main components. Goldrun soils are very deep, somewhat excessively drained, coarse textured, and on moderately sloping to strongly sloping sand sheets. They support Indian ricegrass, western wheatgrass, and big sagebrush.

This map unit is used for livestock grazing and as wildlife habitat. The main limitation is the hazard of erosion.

#### 18. Old Camp-Colbar-Reluctan

*Strongly sloping to steep, shallow and moderately deep, well drained soils on low mountains*

This map unit is in the southern half of the survey area in the Fish Creek and Augusta Mountains and the Shoshone and Toiyabe Ranges. The vegetation is mainly bluebunch wheatgrass, Thurber needlegrass, Wyoming big sagebrush, and black sagebrush on Old Camp soils; bluebunch wheatgrass and Wyoming big sagebrush on Colbar soils; and bluebunch wheatgrass,

Idaho fescue, and mountain big sagebrush on Reluctan soils.

This map unit makes up about 10 percent of the survey area.

The Old Camp series consists of shallow soils on strongly sloping to steep, west- and south-facing mountain summits and side slopes. These soils have a thin, very gravelly and very cobbly, medium textured surface layer and subsoil over hard bedrock.

The Colbar series consists of moderately deep soils on moderately steep to steep, lower, north- and east-facing mountain side slopes. These soils have a thin, very cobbly, medium textured surface layer and a gravelly, moderately fine textured subsoil over hard bedrock.

The Reluctan series consists of moderately deep soils on moderately steep to steep, higher, north- and east-facing mountain side slopes. These soils have a thick, dark, very gravelly and very cobbly, medium textured surface layer and a gravelly, moderately fine textured subsoil over hard bedrock.

Of minor extent in this unit are Walti, Genaw, and Laped soils. Walti soils are moderately deep, fine textured, and on moderately sloping, higher, concave mountain summits. They support Idaho fescue, Thurber needlegrass, and low sagebrush. Genaw soils are shallow, medium textured, and on strongly sloping, low, rolling hill remnants. They support bluebunch wheatgrass and Wyoming big sagebrush. Laped soils are shallow, medium textured, and on low foothill summits in the Augusta Mountains. They support Indian ricegrass, shadscale, and bud sagebrush.

This map unit is used for livestock grazing and as wildlife habitat. The main limitation is the surface rock fragments.

### **Areas Dominated by Soils on High Mountains**

Four map units are in this group. The soils in this group are dominantly on high mountains. Elevations range from 4,900 feet at the base of mountains in the northern part of the survey area to above 9,600 feet on the mountain peaks of the Shoshone Range. The average annual precipitation is 10 to more than 16 inches, the average annual air temperature is 40 to 44 degrees F, and the frost-free season is less than 50 to 90 days.

These soils are gently sloping to very steep, well drained soils. They are shallow, moderately deep, or deep over hard bedrock or the soils are very deep. These soils are not subject to flooding and are not salt or sodium affected.

Some soils are young (Holocene age). Their only soil development is an organic matter enriched layer. Most

of the soils are on older, geomorphic surfaces (Wisconsinan age) exhibiting organic matter enriched layers and a well developed subsoil that has a clay accumulation.

### **19. Sumine-Chen-Rock outcrop**

*Rock outcrop and gently sloping to steep, shallow and moderately deep, well drained soils on high mountains*

This map unit is in the north part of the survey area in the Sheep Creek Range. The vegetation is mainly bluebunch wheatgrass, basin wildrye, and mountain big sagebrush on Sumine soils and Idaho fescue, bluebunch wheatgrass, and low sagebrush on Chen soils. Rock outcrop does not have vegetation.

This map unit makes up about 2 percent of the survey area.

The Sumine series consists of moderately deep soils on steep, mountain side slopes. These soils have a thick, dark, very stony, medium textured surface layer and a very gravelly and very cobbly, moderately fine textured subsoil over hard bedrock.

The Chen series consists of shallow soils on gently sloping to moderately sloping, concave mountain crests. These soils have a thick, dark, very gravelly, medium textured surface layer and a very gravelly and very cobbly, fine textured subsoil over hard bedrock.

Rock outcrop is exposed bedrock on mountain shoulders, cliffs along canyon walls, and scattered peaks.

Of minor extent in this map unit are Susie Creek soils and Rubble land. Susie Creek soils are deep, fine textured, and on gently sloping to strongly sloping, convex mountain crests and shoulders. They support bluebunch wheatgrass, Thurber needlegrass, and mountain big sagebrush. Rubble land consists of rock stripes and screes on mountain side slopes below Rock outcrop. Rubble land does not have vegetation.

This map unit is used for livestock grazing and as wildlife habitat.

### **20. Itca-Reluctan-Punchbowl**

*Moderately steep and steep, shallow and moderately deep, well drained soils on high mountains*

This map unit is in the southern part of the survey area in the Toiyabe and Shoshone Ranges. The vegetation is mainly Indian ricegrass, Thurber needlegrass, and black sagebrush on Punchbowl soils; Idaho fescue, bluebunch wheatgrass, and mountain big sagebrush on Reluctan soils; and bluegrass, singleleaf pinyon pine, and Utah juniper on Itca soils.

This map unit makes up about 4 percent of the survey area.

The Itca series consists of shallow soils on moderately steep and steep, convex mountain crests and side slopes that have mainly eastern and high southern and western aspects. These soils have a thick, dark, very cobbly, medium textured surface layer and a very gravelly, fine textured subsoil over hard bedrock.

The Reluctan series consists of moderately deep soils on moderately steep and steep, concave mountain side slopes that have mainly northern aspects. These soils have a thick, dark, very gravelly and very cobbly, medium textured surface layer and a very gravelly, medium or moderately fine textured subsoil over hard bedrock.

The Punchbowl series consists of shallow soils on moderately steep and steep, lower mountain side slopes that have mainly southern and western aspects. These soils have a thin, very gravelly or extremely stony, medium textured surface layer and a gravelly, medium textured subsoil over hard bedrock.

Of minor extent in this unit are Softscrabble, Cleavage, and Hapgood soils and Rock outcrop. Softscrabble soils are very deep, very gravelly, moderately fine textured soils on higher, north-facing, concave mountain side slopes. In these areas, snow accumulates in winter and the soils support Idaho fescue, bluebunch wheatgrass, and snowberry. Cleavage soils are shallow, very gravelly, medium textured, and on gently sloping to moderately sloping windswept mountain crests. They support Idaho fescue, Webber ricegrass, and low sagebrush. Hapgood soils are very deep, very gravelly, medium textured, and on steep, north-facing snow pockets at high elevations near the southern boundary of the survey area. They support mountain brome, Idaho fescue, and snowberry. Rock outcrop is exposed rimrock along mountain shoulders, cliffs along canyon walls, and scattered peaks. Rock outcrop does not have vegetation.

This map unit is used for livestock grazing and as wildlife habitat. The main limitation is the surface rock fragments.

## 21. Quarz-Walti-Glean

*Strongly sloping to steep, moderately deep and deep, well drained soils on high mountains*

This map unit is in the Shoshone Range and on the Augusta and Battle Mountains. The vegetation is mainly Idaho fescue, bluebunch wheatgrass, mountain big sagebrush, and low sagebrush.

This map unit makes up about 12 percent of the survey area.

The Quarz series consists of moderately deep soils on moderately steep to steep, south- and west-facing mountain side slopes. These soils have a thick, dark,

very gravelly, medium textured surface layer and an extremely gravelly, fine textured subsoil over hard bedrock.

The Glean series consists of deep soils on steep, concave, north-facing mountain side slopes. These soils have a very thick, dark, gravelly, medium textured surface layer and a very gravelly and very cobbly, moderately coarse and medium textured substratum over hard bedrock.

The Walti series consists of moderately deep soils on strongly sloping to moderately steep, convex, mountain crests and shoulders. These soils have a thick, cobbly, medium textured surface layer and a fine textured subsoil over hard bedrock.

Of minor extent in this unit are Reluctan, Cleavage, and Bucan soils and Rock outcrop. Reluctan soils are moderately deep, moderately fine textured, and on moderately steep, east-facing, mountain side slopes. They support Idaho fescue, bluebunch wheatgrass, and mountain big sagebrush. Cleavage soils are shallow, very gravelly, moderately fine textured, and on moderately sloping, windswept, mountain crests. They support Idaho fescue, Webber ricegrass, and low sagebrush. Rock outcrop is exposed bedrock on eroded mountain shoulders and on scattered peaks. Rock outcrop does not have vegetation. Bucan soils are deep, fine textured, and on moderately steep and steep, lower mountain slopes bordering Slaven Canyon. They support Thurber needlegrass, bluebunch wheatgrass, and Wyoming big sagebrush.

This map unit is used for livestock grazing and as wildlife habitat. It is suited to these uses.

## 22. Hapgood-Sumine-Cleavage

*Moderately steep to very steep, shallow, moderately deep and very deep, well drained soils on high mountains*

This map unit is in the Shoshone Range near Mt. Lewis. The vegetation is mainly Idaho fescue, bluebunch wheatgrass, and snowberry on Hapgood soils; bluebunch wheatgrass, basin wildrye, and mountain big sagebrush on Sumine soils; and Idaho fescue, Webber ricegrass, and low sagebrush on Cleavage soils.

This map unit makes up about 3 percent of the survey area.

The Hapgood series consists of very deep soils on steep and very steep, concave, northerly mountain side slopes. These soils have a very thick, dark, very gravelly, medium textured surface layer and a very gravelly and very cobbly, medium textured substratum.

The Sumine series consists of moderately deep soils on moderately steep to steep, southerly facing mountain



side slopes. These soils have a thick, dark, very gravelly, medium textured surface layer and a very gravelly, moderately fine textured subsoil over hard bedrock.

The Cleavage series consists of shallow soils on moderately steep to steep, convex, mountain crests and nose slopes. These soils have a thick, dark, very gravelly surface layer and a very gravelly, moderately fine textured subsoil over hard bedrock.

Of minor extent in this unit are Winada soils and Rock outcrop. Winada soils are moderately deep, moderately fine textured soils on higher, steep, convex, southerly facing mountain side slopes. They support Idaho fescue, bluebunch wheatgrass, and low sagebrush. Rock outcrop is exposed bedrock on mountain shoulders, exposed cliffs along canyon walls, and scattered peaks. Rock outcrop does not have vegetation.

This map unit is mainly used for livestock grazing and as wildlife habitat. The main limitation is the surface rock fragments.

## Broad Land Use Considerations

The soils in this survey area vary widely in their potential for major land uses such as cropland, pasture, rangeland, wildlife habitat, and urban use. Extensive changes in land use are not expected in the foreseeable future.

About 95 percent of the land area is used as rangeland and for related uses. These areas need careful management. Map units 3 and 5 have the highest potential to produce forage. Because these units are near water and produce more palatable plants, they tend to be overused and the range deteriorates. The soils in map units 2, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 are extensively used for range. On these soils the main limitation is generally the inadequate precipitation. On some of these soils, a hardpan or bedrock limits rooting depth. In other areas of these soils, rock fragments on the surface limit use of equipment. The soils in map units 16, 17, 18, 19, 20, 21, and 22 are well suited to range. In most areas of these soils, steepness of slope limits use of equipment. In some areas of these soils, rock fragments on the surface also limit use of equipment. On some soils in map units 16, 18, 20, and 22, the rooting depth is a limitation.

About 4 percent of the land in the survey area is used as irrigated cropland. Approximately 17 percent of the survey area is suitable for use as cropland if irrigation water were available. The main crops grown are alfalfa hay, alfalfa seed, improved grass-legume forage, and small grains, such as barley, wheat, and

oats. Small areas in map units 3, 4, 6, and 7 are used as cropland. On the soils in map unit 3, the seasonal high water table and flooding are limitations. In the rest of map units 4, 6, and 7, no water available for irrigation is the primary limitation.

Most of the water must be pumped from deep strata wells. But wells that produce enough water for these uses are not easily found. The Duric Camborthids of map units 6 and 7 and the Durixerollic Camborthids of map unit 7 are well suited to climatically adapted plants. The short growing season limits the selection of plants. In most areas of the soils in these map units, irrigated crops can be grown if the salt and sodium content is controlled. The slope and the hazard of erosion limit some sloping soils in map units 6 and 7.

Approximately 1 percent of the land in the survey area is used for pasture and meadow hay. The soils in map unit 3 are extensively used for pasture and meadow hay. Most areas of these soils are well suited to this use. On some soils in these areas, the salt and sodium content is a limitation.

Almost all of the land in Lander County, North Part, provides habitat for one or more kinds of wildlife. The Humboldt River, the lower part of Rock Creek, and the Reese River support catfish, black bass, and carp. Several streams and small ponds in the area support trout.

Openland wildlife common to the area includes deer, pheasant, valley quail, cottontail rabbit, meadowlark, and killdeer. These species extensively use the soils, water sources, and the food and cover in the native meadows and pastures in map unit 3. Openland wildlife species also extensively use the irrigated areas and rangeland wildlife, the nonirrigated areas of map units 3, 4, 6, and 7. Watering places are needed when areas are not being irrigated. Fence rows, ditchbanks, and odd corners can be planted with selected plants to improve the habitat. The adjacent areas of range provide additional cover.

The wetland wildlife common to the area includes ducks, geese, herons, muskrat, and beaver. Only map unit 3 has extensive areas of habitat for wetland wildlife. The soils in that map unit support wetland plants. Shallow water areas can be established on the nearly level areas but not on the more sloping areas. Stream entrenchment has drained some areas, which are now poorly suited to use as habitat for wetland wildlife.

The rangeland wildlife common to the area include antelope, mule deer, jackrabbit, chukar, and sage grouse. They extensively use the rest of the map units. In much of the lower elevations of this area, the low precipitation limits the native plant community. Properly designed and located watering facilities benefit wildlife.





## Detailed Soil Map Units

---

The map units delineated on the detailed maps at the back of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and limitations of a unit for specific uses. The soil properties and characteristics described can be used to plan the management needed for those or other uses. More information is given under "Use and Management of the Soils" and "Soil Properties."

A map unit delineation on a map represents an area dominated by one or more major kinds of soils or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans. But if intensive use of small areas is planned, onsite investigation to precisely define and locate the soils and miscellaneous areas is needed. Some delineations joining the Tuscarora Mountain soil survey area have soil names, map unit components, or physiographic positions that are not exactly the same between the two survey areas. These differences stem primarily from a present-day,

better understanding of soil relationships. Although some differences exist, there should be little or no effect in the use of these surveys for management purposes.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes facts about the unit and gives the principal hazards or limitations to be considered in planning for a few specific uses. Soil suitability ratings are given for selected uses, including range seeding; roadfill; daily cover for landfill; shallow excavations; local roads and streets; pond reservoir areas; embankments, dikes, and levees; sand; and gravel. The "Appendix" lists criteria used to develop these ratings.

The detailed soil map units mapped in the survey area reflect the various relationships of soils and component parts of the landscape. Figures 6 and 7 show the soil-physiographic relationship of the survey area on a three-dimensional basis, in contrast to the two-dimensional presentation of the soil map.

Figure 6 shows some delineations in various positions on the landscape.

Each map unit has one or more major soil components and generally has several contrasting inclusions. Figure 7 shows the physiographic position of each major soil component identified within the respective map units.

The unique physiographic position is given in the map unit descriptions for each soil or miscellaneous area identified.

Soils that have profiles that are almost alike make up a *soil series*. The soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of one series can differ in texture of the upper layer or underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Sonoma silt loam, drained, is one of several phases of the Sonoma soils.

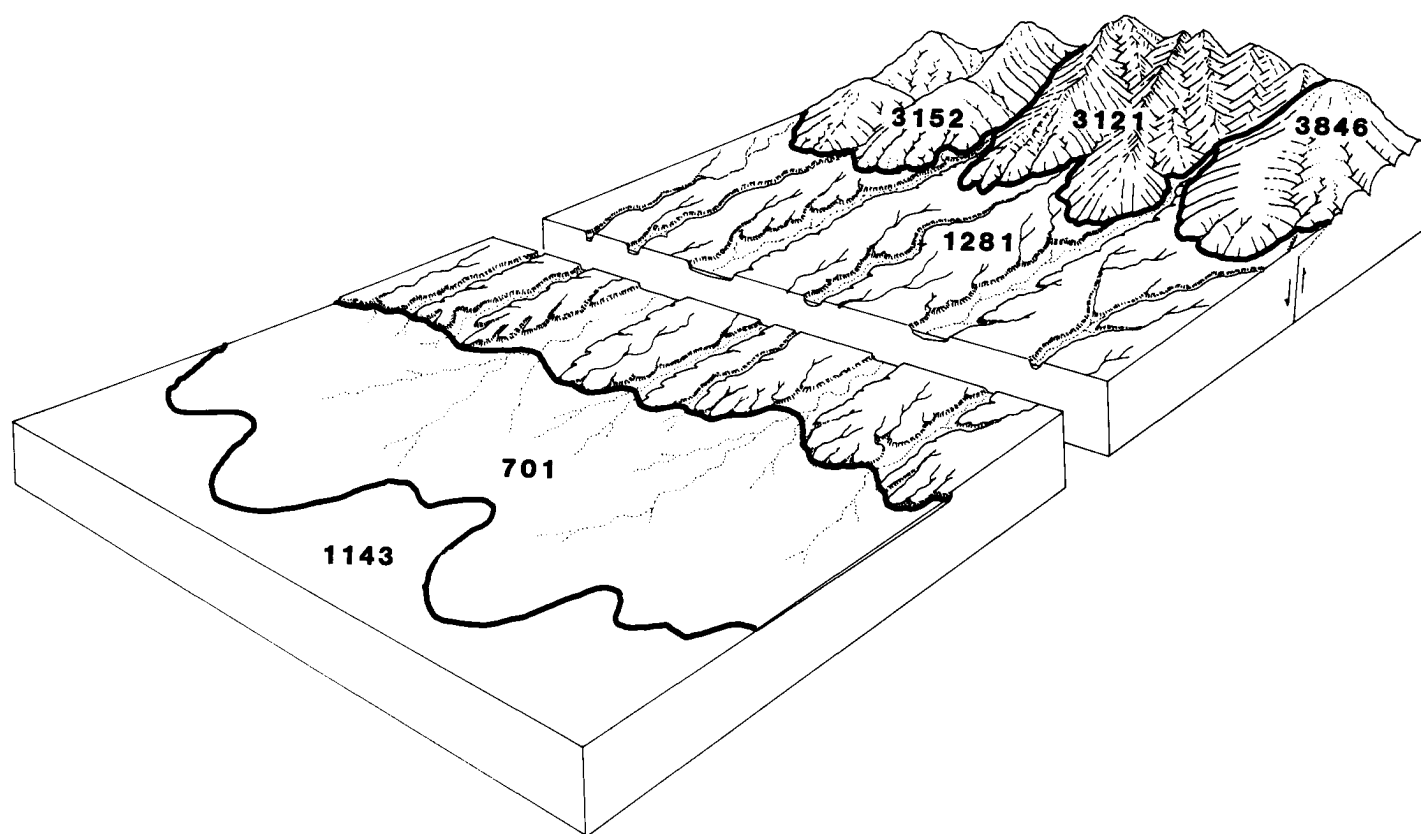


Figure 6.—Typical relationship of detailed soil map units and landscapes: Orovada fine sandy loam, 2 to 4 percent slopes (701); Wendane silt loam, occasionally flooded (1143); Ricert-Whirlo-Pineval association (1281); Walti-Softscrabble-Bucan association (3121); Robson-Reluctan association (3152); and Jung-Wiskan association (3846).

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or associations.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Argenta-Sonoma complex is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Punchbowl-Roca-Rock outcrop association is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or

no vegetation. Playas are an example.

Some areas that are too small to be shown are identified by a special ad hoc symbol on the soil maps.

The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

This survey was mapped at two levels of detail. At the most detailed level, map unit boundaries were plotted and verified at closely spaced intervals. At the less detailed level, map unit boundaries were plotted and verified at wider intervals. The narrowly defined unit indicator is an asterisk in the map legend. The detail of mapping was selected and the map units were designed to meet the needs for the anticipated long-term use of the survey.

Table 4 gives the acreage and proportionate extent of each map unit.

In the map unit descriptions that follow, a semitabular format is used. It uses an uppercase heading, centered in the column (for example, Composition), in identifying the information grouped directly below it. Introducing each item of information under the centered heading is

an italicized term or phrase (for example, Contrasting Inclusions) that identifies or describes the information. Many of the centered headings and introductory terms or phrases are self-explanatory; however, some of them need further explanation and are defined in the Glossary. Some explanations are provided in the following paragraphs, generally in the order in which they are used in the map unit descriptions. More information is given under "Use and Management of the Soils" and "Soil Properties."

*Map unit setting* is given for the entire map unit; it includes position on landscape, elevation, and climate. The position on landscape generally is broader than that given for each major component. The elevation and climatic data apply to the entire unit and are not given for the individual components.

*Composition* is given for the components identified in the name of the map unit as well as for the contrasting inclusions.

Inclusions are areas of components (soils or

miscellaneous areas) that differ from the soils or miscellaneous areas for which the unit is named. Inclusions can be either *similar* or *contrasting*. Similar inclusions are components that differ from the components for which the unit is named but that for purposes of use and management can be considered to be the same as the named components. Note that in the "Composition" paragraph a single percentage is provided for a named soil and the similar inclusions because their use and management are similar.

Contrasting inclusions are components that differ sufficiently from the components for which the unit is named that they would have different use and management if they were extensive enough to be managed separately. For most uses, contrasting inclusions have a limited effect on use and management. Inclusions, which are generally in small areas, could not be mapped separately because of the scale used in mapping. A special symbol identifies some small areas of strongly contrasting inclusions on

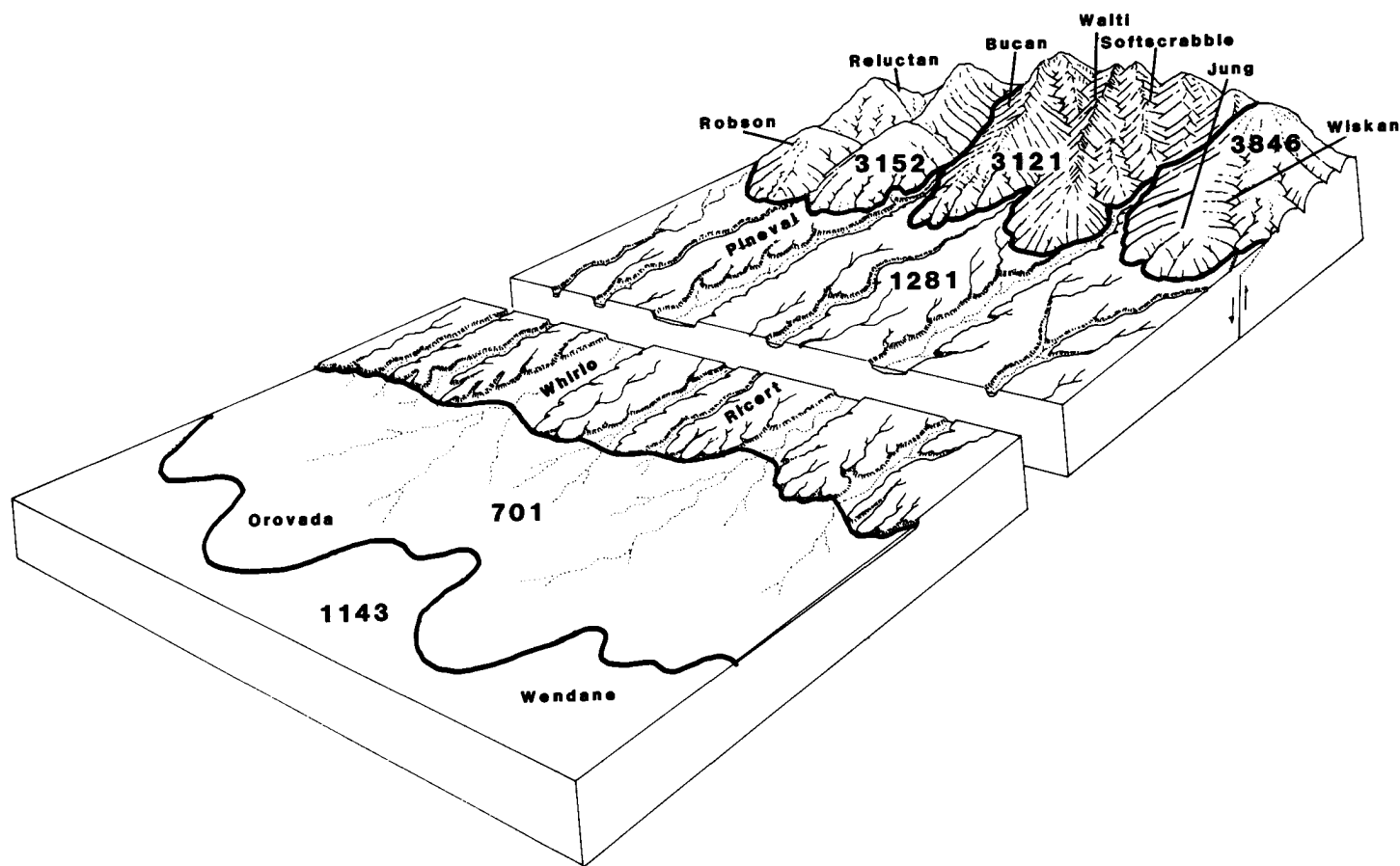


Figure 7.—Typical relationship of detailed soil map units and landscapes: Orovada fine sandy loam, 2 to 4 percent slopes (701); Wendane silt loam, occasionally flooded (1143); Ricert-Whirlo-Pineval association (1281); Walti-Softscrabble-Bucan association (3121); Robson-Reluctan association (3152); and Jung-Wiskan association (3846).

the detailed soil maps. A few inclusions may not have been observed and consequently are not mentioned in the descriptions. This was especially likely to happen where the pattern was so complex that it was impractical to make enough observations to identify all the inclusions on the landscape.

*Characteristics of the soil* are given for position on landscape, parent material, slope features, and dominant present vegetation. Also given for each component soil is the typical block profile and important soil properties.

Capsule descriptions include the content of rock fragments in each soil layer. Rock fragment amounts are given as a percentage of the soil by weight. Care must be taken in the interpretation of rock fragment percentages as it is given in this survey. The percentage of rock fragments that are more than 3 inches in diameter is given for the whole soil. After the cobbles, stones, and boulders (rock fragments more than 3 inches in diameter) are accounted for, the soil material and the pebbles (rock fragments less than 3 inches in diameter) are considered separately. Thus, the percent by weight of pebbles is based only on the content of pebbles in the material of pebble size or smaller. This method of identification of rock fragment percentages is commonly used in the engineering classification and analysis of soils.

*Contrasting inclusions* are described in terms of their position on the landscape, contrasting features, and distinctive present vegetation.

*Major uses* for the map unit are given.

Component soil interpretations are given for *wildlife habitat elements, ratings and restrictive features for selected uses, and interpretative groups*.

## Map Unit Descriptions

### 102—Beowawe Variant-Tomera-Whirlo association

#### Map Unit Setting

*Position on landscape:* Piedmont slopes

*Elevation:* 4,500 to 5,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### Composition

*Major components:*

- Beowawe Variant silt loam, 4 to 8 percent slopes—Typic Natrargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic—30 percent
- Tomera gravelly loam, 8 to 15 percent slopes—

Xerollic Natrargids, fine, montmorillonitic, mesic—30 percent

- Whirlo gravelly sandy loam, 4 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 4 to 15 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—10 percent
- Inclusion 2: Xeric Torriorthents, 2 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

#### Characteristics of the Beowawe Variant Soil

*Position on landscape:* Fan drainageways of slightly dissected parts of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### Typical Profile

- 0 to 7 inches—silt loam; 0 to 5 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 7 to 25 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); prismatic structure; hard, firm; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6, A-7
- 25 to 60 inches or more—extremely gravelly loamy sand; 0 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* In the upper 25 inches—moderately slow; below this depth—very rapid

*Available water capacity:* 4.9 to 5.5 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—3; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Tomera Soil**

*Position on landscape:* Summits and side slopes of fan piedmont remnants

*Parent material:* Mixed sedimentary alluvium with component of pyroclastic material

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass

### **Typical Profile**

0 to 8 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, GM, SM-SC, GM-GC; estimated AASHTO classification—A-2, A-4

8 to 33 inches—gravelly sandy clay, gravelly clay; 30 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SC, CH; estimated AASHTO classification—A-7

33 to 60 inches or more—extremely gravelly sandy loam, very gravelly loamy sand, very cobbly loam; 1 to 40 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 13 to 30); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 33 inches—slow; below this depth—moderately rapid

*Available water capacity:* 5.6 to 7.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Moderate

### **Characteristics of the Whirlo Soil**

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass

### **Typical Profile**

0 to 7 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

7 to 13 inches—gravelly sandy loam, gravelly loam, fine sandy loam; 0 to 10 percent cobbles and stones and 15 to 45 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

13 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 5 to 30 percent cobbles and stones and 50 to 75 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.9 to 5.3 inches

*Water-supplying capacity:* 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans

*Contrasting features:* Occasionally flooded, receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 2**

*Position on landscape:* Adjacent to inset fan channels

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of Beowawe Variant soil for named elements:*

Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of Tomera soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Beowawe Variant Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, shrink-swell

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Tomera Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—hard to pack

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—shrink-swell, low strength

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, too clayey

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Beowawe Variant soil—IVe, irrigated, and VIIs, nonirrigated; Tomera soil—VIs, nonirrigated; Whirlo soil—IIIe, irrigated, and VIIC, nonirrigated

*Range site:* Beowawe Variant soil—024X020N; Tomera soil—024X005N; Whirlo soil—024X002N

## **112—Millerlux-Reluctan-Cleavage association**

### **Map Unit Setting**

*Position on landscape:* Mountains and plateaus

*Elevation:* 6,200 to 6,900 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 70 days

### **Composition**

#### *Major components:*

- Millerlux gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey, montmorillonitic, frigid—35 percent
- Reluctan gravelly loam, 15 to 30 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—30 percent
- Cleavage very gravelly loam, 15 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Quarz very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—5 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Cleavage extremely gravelly loam, 4 to 15 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—3 percent
- Inclusion 4: Cumulic Haploxerolls, 2 to 4 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent

### **Characteristics of the Millerlux Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum slightly influenced by loess; source—basalt and tuffs

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, bluebunch wheatgrass, Thurber needlegrass

### Typical Profile

- 0 to 10 inches—gravelly loam; 5 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4
- 10 to 15 inches—clay; 0 to 10 percent cobbles and stones and 0 to 15 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH; estimated AASHTO classification—A-7
- 15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 12 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 2.0 to 2.4 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Reluctant Soil

*Position on landscape:* North-facing and east-facing side slopes of mountains  
*Parent material:* Kind—colluvium over residuum; source—rhyolite and other extrusive volcanic rock  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue  
*Surface cover:* 15 percent pebbles, 5 percent cobbles

### Typical Profile

- 0 to 13 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
- 13 to 38 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); angular blocky

structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7  
 38 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 4.4 to 5.6 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Cleavage Soil

*Position on landscape:* Shoulders and upper side slopes of mountains  
*Parent material:* Kind—residuum; source—extrusive volcanic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, black sagebrush, bluebunch wheatgrass

### Typical Profile

- 0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2, A-4, A-6
- 4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 25 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow



*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* South-facing and west-facing side slopes of mountains

*Contrasting features:* Moderately deep soil that has a very gravelly clayey subsoil

*Distinctive present vegetation:* Mountain big sagebrush

#### **Inclusion 2**

*Position on landscape:* Scattered peaks and escarpments along canyon walls

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Crests of mountains

*Contrasting features:* Slopes of 4 to 15 percent and an extremely gravelly surface layer

*Distinctive present vegetation:* Low sagebrush, Idaho fescue

#### **Inclusion 4**

*Position on landscape:* Drainageways and canyon bottoms of mountains

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Millerlux soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Reluctan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Millerlux Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, slope

*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, low strength, slope

*Roadfill:* Poor—depth to bedrock, low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Reluctan Soil for Selected Uses**

*Range seeding:* Fair—small stones, rooting depth, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Millerlux soil—VIIe, nonirrigated; Reluctan soil—VIIe, nonirrigated; Cleavage soil—VIIs, nonirrigated

*Range site:* Millerlux soil—024X018N; Reluctan soil—024X021N; Cleavage soil—024X027N

## **120—Alyan-Graley-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,500 to 7,500 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 80 days

## Composition

### Major components:

- Alyan gravelly loam, 4 to 15 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—50 percent
- Graley very gravelly loam, 30 to 50 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—25 percent
- Rock outcrop—15 percent

### Contrasting inclusions:

- Inclusion 1: Puett fine sandy loam, 30 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—5 percent
- Inclusion 2: Welch silt loam, drained, rarely flooded, 0 to 2 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—5 percent

## Characteristics of the Alyan Soil

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—rhyolite, andesite, and siliceous tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Thurber needlegrass

*Typical cover:* 20 percent pebbles, 5 percent cobbles

### Typical Profile

0 to 10 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, CL-ML, CL; estimated AASHTO classification—A-2, A-4, A-6

10 to 16 inches—clay; 0 to 5 percent cobbles and stones and 15 to 25 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

16 to 24 inches—gravelly clay; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7

24 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 3.8 to 4.4 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

## Characteristics of the Graley Soil

*Position on landscape:* Side slopes of mountains

*Parent material:* Mixed colluvium over residuum

*Slope features:* Length—long; shape—convex to smooth

*Dominant present vegetation:* Mountain big sagebrush, antelope bitterbrush, Idaho fescue, bluebunch wheatgrass

### Typical Profile

0 to 7 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 60 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

7 to 14 inches—very gravelly clay, very gravelly clay loam; 0 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.3 to 1.8 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

## Characteristics of Rock Outcrop

*Position on landscape:* Rimrock on shoulders and random peaks on crests of mountains

*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Eroded low hills bordering the mountain front

*Contrasting features:* Lacks a layer of clay accumulation, shallow to soft bedrock

*Distinctive present vegetation:* Black sagebrush, Wyoming big sagebrush, Indian ricegrass

#### **Inclusion 2**

*Position on landscape:* Narrow drainageways of mountains

*Contrasting features:* Very deep soils, a seasonal high water table at a depth of 60 to 96 inches

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Alyan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Graley soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Alyan Soil for Selected Uses**

*Range seeding:* Fair—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, hard to pack

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—shrink-swell

*Roadfill:* Severe—depth to bedrock, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Graley Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, too clayey, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, depth to bedrock, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Alyan soil—VIs, nonirrigated; Graley soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Alyan soil—025X014N; Graley soil—025X012N

## **130—Alley-Dewar association**

### **Map Unit Setting**

*Position on landscape:* Foothills and mountain valley fans

*Elevation:* 5,000 to 5,500 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Alley cobbly fine sandy loam, 30 to 50 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—60 percent

- Dewar very cobbly very fine sandy loam, 4 to 15 percent slopes—Xerollic Durargids, loamy, mixed, mesic, shallow—25 percent

*Contrasting inclusions:*

- Inclusion 1: Alley extremely stony fine sandy loam, 50 to 75 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—10 percent

- Inclusion 2: Rock outcrop—5 percent

### **Characteristics of the Alley Soil**

*Position on landscape:* Side slopes of foothills

*Parent material:* Kind—colluvium and alluvium influenced by loess; source—andesite, basalt, and tuff

*Slope features:* Length—long; shape—concave to smooth

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### **Typical Profile**

0 to 3 inches—cobbly fine sandy loam; 25 to 30 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

3 to 16 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated

Unified classification—SC, GC; estimated AASHTO classification—A-6

16 to 40 inches—gravelly fine sandy loam, cobbly fine sandy loam; 0 to 40 percent cobbles and stones and 20 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

40 to 60 inches or more—very cobbly fine sandy loam; 30 to 45 percent cobbles and stones and 30 to 40 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 6.0 to 7.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Dewar Soil

*Position on landscape:* Crests of mountain-valley fan remnants adjacent to foothills

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### Typical Profile

0 to 4 inches—very cobbly very fine sandy loam; 40 to 50 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

4 to 14 inches—cobbly silty clay loam; 25 to 30 percent cobbles and stones and 10 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than

2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

14 to 60 inches—indurated duripan; massive; extremely hard, extremely firm

### Soil and Water Features

*Depth to hardpan:* 13 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.9 to 2.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex side slopes of foothills below rimrock

*Contrasting features:* Extremely stony surface, slopes of more than 50 percent

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### Inclusion 2

*Position on landscape:* Rimrock and scattered peaks on foothills

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Alley soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Dewar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Alley Soil for Selected Uses

*Range seeding:* Fair—large stones, erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim, small stones, slope  
*Pond reservoir areas:* Severe—slope, seepage  
*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Dewar Soil for Selected Uses**

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—cemented pan  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan, low strength  
*Roadfill:* Poor—cemented pan, low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—large stones, cemented pan  
*Pond reservoir areas:* Severe—cemented pan, slope  
*Embankments, dikes, and levees:* Severe—thin layer, large stones

#### **Interpretive Groups**

*Capability classification:* Alley soil—VIs, irrigated, and VIIs, nonirrigated; Dewar soil—IVs, irrigated, and VIIs, nonirrigated  
*Range site:* Alley soil—024X005N; Dewar soil—024X005N

### **131—Alley-Rock outcrop-Rubble land association**

#### **Map Unit Setting**

*Position on landscape:* Foothills  
*Elevation:* 5,000 to 5,200 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Alley very cobbly very fine sandy loam, 50 to 75 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—45 percent
- Rock outcrop—25 percent
- Rubble land—20 percent

*Contrasting Inclusions:*

- Inclusion 1: Alley cobbly fine sandy loam, 30 to 50 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—5 percent
- Inclusion 2: Lithic Xerollic Haplargids, 0 to 4 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—5 percent

#### **Characteristics of the Alley Soil**

*Position on landscape:* Side slopes of foothills  
*Parent material:* Kind—colluvium and alluvium influenced by loess; source—volcanic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, spiny hopsage

#### **Typical Profile**

0 to 3 inches—very cobbly very fine sandy loam; 30 to 40 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM, SM-SC, SM; estimated AASHTO classification—A-2  
 3 to 16 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SC, GC; estimated AASHTO classification—A-6  
 16 to 40 inches—gravelly fine sandy loam, cobbly fine sandy loam; 0 to 40 percent cobbles and stones and 20 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4  
 40 to 60 inches or more—very cobbly fine sandy loam; 30 to 45 percent cobbles and stones and 30 to 40 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 6.0 to 7.5 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—high; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

#### **Characteristics of Rock Outcrop**

*Position on landscape:* Rimrock on shoulders and scattered peaks of foothills

*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Barren

### **Characteristics of Rubble Land**

*Position on landscape:* Rock stripes and scree on side slopes of foothills below Rock outcrop  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Barren

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex upper side slopes of foothills  
*Contrasting features:* Cobbly surface, slopes of less than 50 percent  
*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

#### **Inclusion 2**

*Position on landscape:* Crests of foothills  
*Contrasting features:* Hard bedrock within a depth of 20 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Alley soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Alley Soil for Selected Uses**

*Range seeding:* Poor—large stones, erodes easily  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—area reclaim, small stones, slope  
*Pond reservoir areas:* Severe—slope, seepage  
*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Alley soil—VIIs, nonirrigated; Rock outcrop—VIIs; Rubble land—VIIs  
*Range site:* Alley soil—024X005N

## **140—Antel silt loam**

### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,600 to 5,000 feet  
*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Antel silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—85 percent

#### **Contrasting inclusions:**

- Inclusion 1: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—10 percent
- Inclusion 2: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent

### **Characteristics of the Antel Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Kind—silty alluvium; source—volcanic rock, tuff, loess, and volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, seepweed, bud sagebrush

### **Typical Profile**

0 to 11 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 11 to 60 inches or more—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 35 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 9.4 to 12.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower margin of fan skirts  
*Contrasting features:* Strongly salt- and sodium-affected surface layer

*Distinctive present vegetation:* Black greasewood, shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth inset fans, which slightly dissect the fan skirts

*Contrasting features:* Nonsaline to a depth of 30 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Septic tank absorption fields:* Severe—percs slowly

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

## **141—Antel silt loam, moderately sodic**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,600 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

• Antel silt loam, moderately sodic, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—85 percent

#### **Contrasting inclusions:**

• Inclusion 1: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—10 percent

• Inclusion 2: Wholan silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—5 percent

### **Characteristics of the Antel Soil**

*Position on landscape:* Fan skirts

*Parent material:* Kind—alluvium influenced by loess and volcanic ash; source—volcanic rock, tuffs

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, pepperweed

### **Typical Profile**

0 to 11 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

11 to 60 inches or more—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 9.0); moderately saline to strongly saline (8 to 25 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 9.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly elevated areas on smooth fan skirts

*Contrasting features:* Weak discontinuous cementation in the substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Adjacent smooth to slightly concave inset fans

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Winterfat, Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess sodium

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

## **142—Antel silty clay loam**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,600 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

• Antel silty clay loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—85 percent

#### **Contrasting inclusions:**

• Inclusion 1: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—10 percent

• Inclusion 2: Relley silty clay loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent

### **Characteristics of the Antel Soil**

*Position on landscape:* Fan skirts

*Parent material:* Kind—alluvium influenced by loess and volcanic ash; source—volcanic rock and tuffs

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, pepperweed, seepweed

### **Typical Profile**

0 to 11 inches—silty clay loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—CL; estimated AASHTO classification—A-6

11 to 60 inches or more—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 35 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 9.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent inset fans

*Contrasting features:* Slightly coarser textured subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush



**Inclusion 2**

*Position on landscape:* Upper margins of fan skirts and adjacent to inset fans

*Contrasting features:* Nonsaline to a depth of 30 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Deep to water

*Irrigation:* Percs slowly, erodes easily, excess salt

*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

**143—Antel silty clay loam, occasionally flooded****Map Unit Setting**

*Position on landscape:* Stream terraces

*Elevation:* 4,600 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Antel silty clay loam, 0 to 2 percent slopes,

occasionally flooded—Duric Camborthids, fine-silty, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes, occasionally flooded—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—10 percent
- Inclusion 2: Creemon silt loam, 0 to 2 percent slopes, occasionally flooded—Duric Camborthids, coarse-silty mixed, mesic—5 percent

**Characteristics of the Antel Soil**

*Position on landscape:* Stream terraces

*Parent material:* Kind—alluvium influenced by loess and volcanic ash; source—volcanic rock and tuffs

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, basin big sagebrush, shadscale, black greasewood, basin wildrye

**Typical Profile**

0 to 11 inches—silty clay loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6

11 to 60 inches or more—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; moderately alkaline (pH 8.2); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Frequency—occasional;

duration—brief; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 9.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Slightly higher lying, irregularly shaped outer margins of the stream terraces

*Contrasting features:* Rarely flooded

*Distinctive present vegetation:* Bud sagebrush, winterfat, saltbush

#### **Inclusion 2**

*Position on landscape:* Fan skirts adjacent to stream terraces

*Contrasting features:* Coarser textured subsoil

*Distinctive present vegetation:* Winterfat, shadscale, and bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Severe—flooding

*Local roads and streets:* Severe—low strength, flooding

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Flooding

*Irrigation:* Flooding, excess sodium, erodes easily

*Terraces:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIw, irrigated, and VIw, nonirrigated

*Range site:* 024X006N

## **150—Argenta very fine sandy loam**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,400 to 4,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Argenta very fine sandy loam, 0 to 2 percent slopes—

Aeric Halaquepts, coarse-loamy, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Rixie silty clay loam, 0 to 2 percent slopes—Aeric Duric Haploxerolls, fine-loamy, mixed, mesic—5 percent

- Inclusion 2: Sonoma silty clay loam, strongly saline, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 3: Wendane silt loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Argenta Soil**

*Position on landscape:* Broad flood plain remnants and adjacent to stream channels

*Parent material:* Kind—alluvium high in pyroclastic material; source—volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, saltbush, rabbitbrush, inland saltgrass

### **Typical Profile**

- 0 to 7 inches—very fine sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 50 to 65); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 7 to 45 inches—stratified fine sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 45 to 60 inches or more—gravelly sandy loam; 35 to 45 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* February through July—36 to 40 inches; rest of year—below this depth

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 6.5 to 9.2 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Depressions on flood plains  
*Contrasting features:* Dark colored surface layer, slightly salt and sodium affected, frequently flooded  
*Distinctive present vegetation:* Basin wildrye, creeping wildrye

#### **Inclusion 2**

*Position on landscape:* Narrow, lower flood plain remnants  
*Contrasting features:* Finer textured subsoil, occasionally flooded  
*Distinctive present vegetation:* Alkali sacaton, alkali muhly

#### **Inclusion 3**

*Position on landscape:* Alluvial flats on outer margins of flood plains  
*Contrasting features:* Finer textured subsoil  
*Distinctive present vegetation:* Alkali sacaton, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; grass and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—fair; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—wetness

*Local roads and streets:* Severe—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, excess sodium, excess salt

*Drainage:* Frost action

*Irrigation:* Soil blowing, erodes easily

*Terraces and diversions:* Erodes easily, soil blowing

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X011N

## **152—Argenta-Sonoma complex**

### **Map Unit Setting**

*Position on landscape:* Flood plains  
*Elevation:* 4,400 to 4,700 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Argenta very fine sandy loam, 0 to 4 percent slopes—Aeric Halaquepts, coarse-loamy, mixed (calcareous), mesic—70 percent
- Sonoma silty clay loam, drained, strongly saline, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Sonoma silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Argenta Soil**

*Position on landscape:* Flood plain remnants

*Parent material:* Kind—alluvium; source—dominantly volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, inland saltgrass, alkali sacaton

### **Typical Profile**

- 0 to 7 inches—very fine sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 50 to 65); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 7 to 45 inches—stratified fine sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 45 to 60 inches or more—gravelly sandy loam; 35 to 45 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to seasonal high water table:* February through July—32 to 40 inches; rest of year—below this depth

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 6.5 to 9.2 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### Characteristics of the Sonoma Soil

*Position on landscape:* Recently entrenched part of flood plain remnants

*Parent material:* Kind—alluvium; source—dominantly volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Willow, basin big sagebrush, silver sagebrush, inland saltgrass, basin wildrye

### Typical Profile

0 to 8 inches—silty clay loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 25 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

8 to 60 inches or more—stratified silty clay loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* December through March—42 to 60 inches; rest of year—more than 60 inches

*Frequency of flooding:* Frequency—occasional; duration—brief; months—March through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Smooth, irregularly shaped flood plains

*Contrasting features:* Receives additional soil moisture from flooding and the seasonal high water table

*Distinctive present vegetation:* Basin wildrye, creeping wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### Wildlife habitat elements:

*Suitability of the Argenta soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—fair; shallow water areas—fair

*Suitability of the Sonoma soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—good

### Ratings and Restrictive Features of the Argenta Soil for Selected Uses and Practices

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—wetness

*Local roads and streets:* Severe—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

*Drainage:* Frost action

*Irrigation:* Soil blowing, erodes easily

*Terraces and diversions:* Erodes easily, soil blowing

### Ratings and Restrictive Features of the Sonoma Soil for Selected Uses and Practices

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt

*Shallow excavations:* Moderate—wetness, flooding

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Frost action

*Irrigation:* Erodes easily, flooding, excess salt

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* Argenta soil, VIw, irrigated, and VIIw, nonirrigated; Sonoma soil, IIIw, irrigated, and VIIw, nonirrigated

*Range site:* Argenta soil—024X011N; Sonoma soil—024X007N

## **160—Batan fine sandy loam**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Batan fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—10 percent
- Inclusion 2: Misad gravelly fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

### **Characteristics of the Batan Soil**

*Position on landscape:* Irregularly shaped alluvial flat remnants

*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rocks high in pyroclastic materials

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—fine sandy loam; platy structure; hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 40 mmhos/cm); moderately sodic (SAR

35 to 46); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.1 to 12.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth outer margin of alluvial flats remnants

*Contrasting features:* Coarser textured substratum

*Distinctive present vegetation:* Black greasewood, shadscale

#### **Inclusion 2**

*Position on landscape:* Smooth inset fans and fan skirts adjacent to the upper margin of alluvial flats

*Contrasting features:* Very gravelly substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Septic tank absorption field:* Severe—percs slowly  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Severe—low strength  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt, excess sodium  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—excess salt, excess sodium  
*Drainage:* Deep to water  
*Irrigation:* Soil blowing, excess salt, excess sodium  
*Terraces and diversions:* Erodes easily, soil blowing

### **Interpretive Groups**

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated  
*Range site:* 024X003N

## **161—Batan silt loam**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats  
*Elevation:* 4,400 to 5,000 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—85 percent

#### *Contrasting inclusions:*

- Inclusion 1: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 2: Rosney silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Sonoma silt loam, strongly saline, 0 to 2 percent slopes, rarely flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Batan Soil**

*Position on landscape:* Alluvial flat remnants  
*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rock high in pyroclastics  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, black greasewood, littleleaf horsebrush, bud sagebrush, seepweed

### **Typical Profile**

0 to 5 inches—silt loam; platy structure; hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 40 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 11.3 to 12.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth, slightly higher parts of alluvial flat remnants

*Contrasting features:* Loamy soil profile

*Distinctive present vegetation:* Black greasewood, shadscale, and bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth recent alluvial flats near channels

*Contrasting features:* More permeable soil profile

*Distinctive present vegetation:* Black greasewood, shadscale, and bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Smooth flood plains adjacent to alluvial flats

*Contrasting features:* Seasonal high water table at a depth of about 40 inches

*Distinctive present vegetation:* Basin wildrye, black greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt, excess sodium

*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X003N

**162—Batan silt loam, occasionally flooded****Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Batan silt loam, 0 to 2 percent slopes, occasionally flooded—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Creemon silt loam, 0 to 2 percent slopes, occasionally flooded—Duric Camborthids, coarse-silty, mixed, mesic—5 percent
- Inclusion 2: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent
- Inclusion 3: Wholan very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—5 percent

**Characteristics of the Batan Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rock high in pyroclastics

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bud sagebrush, winterfat, bottlebrush squirreltail

**Typical Profile**

0 to 5 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 40 inches—stratified silt loam to silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6

40 to 60 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, firm; strongly alkaline (pH 8.8); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL; estimated AASHTO classification—A-6

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Frequency—occasional; duration—very brief; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 11.3 to 12.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Outer margin of alluvial flat adjacent to inset fans

*Contrasting features:* Coarse textured soil profile

*Distinctive present vegetation:* Winterfat and bud sagebrush

**Inclusion 2**

*Position on landscape:* Fan skirts adjacent to alluvial flat remnants

*Contrasting features:* Rarely flooded

*Distinctive present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Inclusion 3**

*Position on landscape:* Adjacent smooth to slightly concave inset fans

*Contrasting features:* Coarser textured soil profile

*Distinctive present vegetation:* Winterfat and bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—low strength, flooding

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Moderate—excess salt

*Drainage:* Deep to water

*Irrigation:* Flooding, excess salt, excess sodium

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X004N

## **163—Batan silt loam, slightly saline**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Batan silt loam, slightly saline, 0 to 2 percent slopes—

Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

- Inclusion 2: Raglan silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—5 percent

- Inclusion 3: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent

### **Characteristics of the Batan Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rock high in pyroclastics

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, littleleaf horsebrush, bud sagebrush

### **Typical Profile**

0 to 5 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR 2 to 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth margins of alluvial flats

*Contrasting features:* Coarser textured soil profile

*Distinctive present vegetation:* Shadscale, black greasewood, bottlebrush, squirreltail



**Inclusion 2**

*Position on landscape:* Smooth fan skirts adjacent to alluvial flats

*Contrasting features:* Coarser textured soil profile

*Distinctive present vegetation:* Shadscale and bud sagebrush

**Inclusion 3**

*Position on landscape:* Smooth inset fans dissecting upper part of alluvial flats

*Contrasting features:* Nonsaline soil profile

*Distinctive present vegetation:* Shadscale and bud sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess sodium

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

**164—Batan-Raglan-Rosney association****Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,700 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition****Major components:**

- Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—30 percent
- Raglan silt loam, strongly saline-sodic, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—30 percent
- Rosney silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—25 percent

**Contrasting inclusions:**

- Inclusion 1: Creemon very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—10 percent
- Inclusion 2: Teman silt loam, 0 to 2 percent slopes—Durixerollic Calciorthids, fine-silty, mixed, mesic—5 percent

**Characteristics of the Batan Soil**

*Position on landscape:* Lower part of alluvial flat remnants

*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rock high in pyroclastics

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, bud sagebrush

**Typical Profile**

0 to 5 inches—silt loam; platy structure; hard, friable; strongly alkaline (pH 8.8); strongly saline (16 to 40 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Raglan Soil**

*Position on landscape:* Foot slopes of fan skirts overplacing the upper part of alluvial flat remnants  
*Parent material:* Loess influenced by volcanic ash with an admixture of mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, shadscale, bud sagebrush

### **Typical Profile**

0 to 6 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4  
 6 to 14 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6  
 14 to 60 inches or more—stratified fine sandy loam to silty clay loam; 0 to 5 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 9.6 to 11.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Rosney Soil**

*Position on landscape:* Upper part of alluvial flat remnants

*Parent material:* Loess mantled mixed silty alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Saltbush, Indian ricegrass

### **Typical Profile**

0 to 7 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 7 to 25 inches—silt loam; massive; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (30 to 40 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 25 to 60 inches or more—stratified silt loam to silty clay; massive; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately to strongly sodic (SAR 30 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 10.2 to 11.4 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.64; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Fan skirts adjacent to the upper part of alluvial flats

*Contrasting features:* Coarser textured substratum and a nonsaline-alkali surface layer

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Active inset fans and areas adjacent to channels on alluvial flat remnants

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Basin wildrye, Wyoming big sagebrush, black greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Batan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Raglan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Rosney soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings of the Batan Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

**Ratings of the Raglan Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Fair—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, excess salt

**Ratings of the Rosney Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Interpretive Groups

*Capability classification:* Batan soil—IIIs, irrigated, and VIIs, nonirrigated; Raglan soil—VIIs, nonirrigated; Rosney soil—VIIs, nonirrigated

*Range site:* Batan soil—024X003N; Raglan soil—024X003N; Rosney soil—024X012N

## 166—Batan-Wendane-Sonoma association

### Map Unit Setting

*Position on landscape:* Basin floor

*Elevation:* 4,600 to 4,900 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—30 percent

- Wendane silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—30 percent

- Sonoma silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—8 percent

- Inclusion 2: Typic Torriorthents, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—7 percent

### Characteristics of the Batan Soil

*Position on landscape:* Alluvial flat remnants

*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rock high in pyroclastics

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, black greasewood, basin wildrye, littleleaf horsebrush

### Typical Profile

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 40 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46);

estimated Unified classification—CL; estimated AASHTO classification—A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—.5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Wendane Soil**

*Position on landscape:* Alluvial flats  
*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, big saltbush, basin wildrye

### **Typical Profile**

0 to 13 inches—silty clay loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (30 to 50 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7  
 13 to 27 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 27 to 60 inches or more—stratified silt loam to clay loam; massive; hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 25 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through July—30 to 48 inches; rest of year—below 48 inches  
*Frequency of flooding:* Frequency—frequent; duration—brief or long; months—February through June  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—.5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Characteristics of the Sonoma Soil**

*Position on landscape:* Flood plains

*Parent material:* Silty mixed alluvium with some influence from volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, basin big sagebrush, basin wildrye

### **Typical Profile**

0 to 8 inches—silty clay loam; subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
 8 to 60 inches or more—stratified silty clay loam to silt loam; massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* In February through June—18 to 36 inches; rest of year—below 36 inches

*Frequency of flooding:* Frequency—frequent; duration—brief or long; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—.5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent smooth fan skirts

*Contrasting features:* Moderately well drained soil with a fine sandy loam profile

*Distinctive present vegetation:* Black greasewood, basin big sagebrush, basin wildrye

#### **Inclusion 2**

*Position on landscape:* Smooth stream terraces

*Contrasting features:* Well drained

*Distinctive present vegetation:* Black greasewood, shadscale, basin big sagebrush

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Batan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Wendane soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

*Suitability of the Sonoma soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—good; shallow water areas—fair

#### **Ratings of the Batan Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Wendane Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, wetness

*Local roads and streets:* Severe—flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

#### **Ratings of the Sonoma Soil for Selected Uses**

*Range seeding:* Poor—excess salt

*Daily cover for landfill:* Fair—too clayey, wetness

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—excess salt, too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—wetness

#### **Interpretive Groups**

*Capability classification:* Batan soil—IIIs, irrigated, and VIIs, nonirrigated; Wendane soil—VIIw, nonirrigated; Sonoma soil—IIIw, irrigated, and VIw, nonirrigated

*Range site:* Batan soil—024X003N; Wendane soil—024X007N; Sonoma soil—025X001N

### **167—Batan-Wendane-Valmy association**

#### **Map Unit Setting**

*Position on landscape:* Alluvial flats and fan skirts

*Elevation:* 4,700 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—35 percent

- Wendane silt loam, drained, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—30 percent

- Valmy very fine sandy loam, silty substratum, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—10 percent

- Inclusion 2: Duric Camborthids, 0 to 2 percent slopes, occasionally flooded—Duric Camborthids, fine-silty, mixed, mesic—5 percent

#### **Characteristics of the Batan Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rock high in pyroclastics

*Slope features:* Length—long; shape—smooth to slightly concave

*Dominant present vegetation:* Shadscale, black greasewood

**Typical Profile**

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 40 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

**Characteristics of the Wendane Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Big saltbush, black greasewood, seepweed

**Typical Profile**

0 to 8 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 35 to 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

8 to 60 inches or more—silty clay loam, silt loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 25 to 30); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Frequency—occasional; duration—brief; months—December through May

*Permeability:* Moderately slow

*Available water capacity:* 10.2 to 12.0 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Moderate

**Characteristics of the Valmy Soil**

*Position on landscape:* Lower part of fan skirts

*Parent material:* Thin loess mantle influenced by volcanic ash over mixed alluvium

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Basin big sagebrush, black greasewood, shadscale, spiny horsebrush

**Typical Profile**

0 to 6 inches—very fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

6 to 46 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, friable; very strongly alkaline (pH 9.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

46 to 60 inches or more—silty clay loam; massive; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-6, A-7

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 46 inches—moderately rapid; below this depth—moderately slow

*Available water capacity:* 8.6 to 10.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—4; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Upper part of fan skirts

*Contrasting features:* Well drained soil with a strongly saline-sodic profile

*Distinctive present vegetation:* Shadscale, black greasewood

#### **Inclusion 2**

*Position on landscape:* Inset fans dissecting alluvial flat remnants

*Contrasting features:* Receives additional soil moisture from runoff and flooding

*Distinctive present vegetation:* Black greasewood, basin big sagebrush, rubber rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Batan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Wendane soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Valmy soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### **Ratings of the Batan Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Ratings of the Wendane Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess sodium

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—flooding

*Roadfill:* Fair—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

### **Ratings of the Valmy Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Fair—thin layer

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Batan soil—IIIs, irrigated, and VIIs, nonirrigated; Wendane soil—VIIs, nonirrigated; Valmy soil—IIc, irrigated, and VIIc, nonirrigated

*Range site:* Batan soil—024X003N; Wendane soil—024X015N; Valmy soil—024X022N

## **168—Batan-Bubus-Ocala association**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 5,000 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—35 percent

- Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—35 percent

- Ocala silt loam, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Camborthids, 0 to 2 percent slopes—Durixerollic Camborthids, fine-silty, mixed, mesic—5 percent

- Inclusion 2: Duric Camborthids, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

### **Characteristics of the Batan Soil**

*Position on landscape:* Lower part of alluvial flat remnants shallowly dissected by stream channels

*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rock high in pyroclastics

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, black greasewood, bottlebrush squirreltail

#### **Typical Profile**

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-6

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

#### **Characteristics of the Bubus Soil**

*Position on landscape:* Upper part of alluvial flat remnants shallowly dissected by stream channels  
*Parent material:* Mixed alluvium high in pyroclastics  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, black greasewood, bottlebrush squirreltail

#### **Typical Profile**

0 to 6 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); strongly saline (16 to 25 mmhos/cm); slightly to moderately sodic (SAR 20 to 30); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified

classification—ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 9.0 to 10.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

#### **Characteristics of the Ocala Soil**

*Position on landscape:* Alluvial flats  
*Parent material:* Mixed alluvium influenced by volcanic ash  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, inland saltgrass, basin wildrye

#### **Typical Profile**

0 to 13 inches—silt loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML, CL; estimated AASHTO classification—A-4, A-6

13 to 60 inches or more—silt loam, silty clay loam; massive; slightly hard and hard, friable and firm; strongly alkaline (pH 8.8); slightly saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

#### **Soil and Water Features**

*Depth to seasonal high water table:* In February through May—42 to 60 inches; rest of year—below 60 inches  
*Frequency of flooding:* Frequency—occasional; duration—long; months—March through May  
*Permeability:* Slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate



*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans dissecting alluvial flat remnants

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, black greasewood, basin wildrye

#### **Inclusion 2**

*Position on landscape:* Slightly concave fan skirt remnants adjacent to alluvial flats

*Contrasting features:* Noncalcareous surface layer

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Batan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Bubus soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Ocala soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

#### **Ratings of the Batan Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Bubus Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

#### **Ratings of the Ocala Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—wetness, flooding

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Interpretive Groups**

*Capability classification:* Batan soil—IIIs, irrigated, and VIIs, nonirrigated; Bubus soil—IIs, irrigated, and VIIs, nonirrigated; Ocala soil—VIIw, nonirrigated

*Range site:* Batan soil—024X003N; Bubus soil—024X003N; Ocala soil—024X007N

## **169—Batan-Ocala-Ocala, rarely flooded, association**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,500 to 5,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—35 percent

- Ocala silty clay loam, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—25 percent

- Ocala silty clay loam, 0 to 2 percent slopes, rarely flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Aquic Durorthidic Torriorthents, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 2: Playas—5 percent

- Inclusion 3: Xeric Torriorthents, 8 to 15 percent

slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

### **Characteristics of the Batan Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rock high in pyroclastics

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, black greasewood, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 40 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Ocala Soil**

*Position on landscape:* Alluvial flats near shallow channels

*Parent material:* Silty alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, basin wildrye, inland saltgrass

### **Typical Profile**

0 to 13 inches—silt clay loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); moderately

sodic (SAR 30 to 46); estimated Unified classification—ML, CL; estimated AASHTO classification—A-7

13 to 60 inches or more—silt loam, silty clay loam; massive; slightly hard and hard, friable and firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through May—42 to 60 inches; rest of year—below 60 inches

*Frequency of flooding:* Frequency—occasional; duration—long; months—March through May

*Permeability:* Slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Characteristics of the Ocala, Rarely Flooded, Soil**

*Position on landscape:* Slightly higher unchanneled alluvial flats

*Parent material:* Silty alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood

### **Typical Profile**

0 to 6 inches—silty clay loam; platy structure; hard, friable; very strongly alkaline (pH 9.4); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML, CL; estimated AASHTO classification—A-7

6 to 13 inches—silt loam, silty clay loam; massive; hard, friable; very strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 35 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

13 to 60 inches or more—silt loam, silty clay loam; 0 to 10 percent pebbles (by weight); massive; hard and slightly hard, firm and friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm);

moderately sodic (SAR 25 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* February through May—42 to 60 inches; rest of year—below 60 inches

*Frequency of flooding:* Rare

*Permeability:* Slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Ponded

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave, active inset fans dissecting alluvial flat remnants

*Contrasting features:* Slightly saline-sodic profile

*Distinctive present vegetation:* Basin big sagebrush, black greasewood

#### Inclusion 2

*Position on landscape:* Small, irregularly shaped depressions adjacent to the lower margin of alluvial flats

*Contrasting features:* Areas pond water for prolonged periods and have thick, hard vesicular crusts

*Distinctive present vegetation:* Barren

#### Inclusion 3

*Position on landscape:* Convex stabilized dunes on alluvial flats

*Contrasting features:* Sandy loam soil profile

*Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Batan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Ocala soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

*Suitability of the Ocala, rarely flooded, soil for named elements:* Wild herbaceous plants (nonirrigated)—

very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### Ratings of the Batan Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Ratings of the Ocala Soil for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—wetness, flooding

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Ratings of the Ocala, Rarely Flooded, Soil for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium, too crusty

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—wetness

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Interpretive Groups

*Capability classification:* Batan soil—IIIs, irrigated, and VIIs, nonirrigated; Ocala soil—VIIw, nonirrigated; Ocala, rarely flooded, soil—VIIw, nonirrigated

*Range site:* Batan soil—024X003N; Ocala soil—024X007; Ocala, rarely flooded, soil—024X011N

**170—Beoska silt loam, 0 to 2 percent slopes****Map Unit Setting***Position on landscape:* Fan piedmonts*Elevation:* 4,600 to 5,600 feet*Average annual precipitation:* About 7 inches*Average annual air temperature:* About 49 degrees F*Frost-free season:* About 110 days**Composition***Major components:*

- Beoska silt loam, 0 to 2 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Blacka very fine sandy loam, 0 to 2 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Tenabo silt loam, 0 to 2 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—5 percent

**Characteristics of the Beoska Soil***Position on landscape:* Nonburied fan piedmont remnants*Parent material:* Loess over loamy and gravelly mixed alluvium*Slope features:* Length—long; shape—smooth*Dominant present vegetation:* Shadscale, bud sagebrush, pepperweed, Indian ricegrass, bottlebrush squirreltail, cheatgrass**Typical Profile**

0 to 13 inches—silt loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—gravelly very fine sandy loam; 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 62 inches or more—very gravelly fine sandy loam; 50 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

**Soil and Water Features***Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid*Available water capacity:* 7.9 to 9.8 inches*Water-supplying capacity:* 7 inches*Runoff:* Very slow*Hydrologic group:* B*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6*Hazard of erosion:* By water—slight; by wind—slight*Shrink-swell potential:* Low*Corrosivity:* To steel—high; to concrete—high*Potential frost action:* Low**Contrasting Inclusions****Inclusion 1***Position on landscape:* Convex, slightly higher fan aprons on fan piedmont remnants*Contrasting features:* A strongly cemented hardpan at a depth of less than 40 inches*Distinctive present vegetation:* Shadscale, bud sagebrush**Inclusion 2***Position on landscape:* Smooth inset fans and fan skirts at lower edge of fan piedmont remnants*Contrasting features:* Coarser textured subsoil*Distinctive present vegetation:* Shadscale, bud sagebrush**Inclusion 3***Position on landscape:* Smooth upper part of fan piedmont remnants*Contrasting features:* Indurated hardpan at a depth of 10 to 20 inches*Distinctive present vegetation:* Shadscale, bud sagebrush**Major Uses****Current uses:** Rangeland, wildlife habitat, irrigated cropland**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants

(nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Excess salt, excess sodium

*Irrigation:* Erodes easily, excess sodium

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

## **171—Beoska silt loam, 2 to 8 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Beoska silt loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Blacka very fine sandy loam, 2 to 8 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Broyles very fine sandy loam, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—4 percent
- Inclusion 3: Tenabo silt loam, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—4 percent
- Inclusion 4: Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—2 percent

### **Characteristics of the Beoska Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Loess over loamy and gravelly mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, pepperweed, Indian ricegrass, bottlebrush squirreltail, cheatgrass

### **Typical Profile**

0 to 13 inches—silt loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; slightly hard, firm; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, firm; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 7.9 to 9.8 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly convex fan aprons on fan piedmont remnants

*Contrasting features:* Coarser subsoils and a strongly cemented hardpan within a depth of 40 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth inset fans dissecting the lower fan piedmont and adjacent fan skirts

*Contrasting features:* Coarser textured subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Smooth, slightly dissected summits in the upper parts of fan piedmont remnants

*Contrasting features:* Indurated hardpan at a depth of 10 to 20 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 4**

*Position on landscape:* Concave drainageways and inset fans dissecting the upper part of the fan piedmont

*Contrasting features:* Coarser subsoil; receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess sodium, slope

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIIe, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

## **172—Beoska-Tenabo silt loams, nearly level**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Beoska silt loam, 0 to 2 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—60 percent
- Tenabo silt loam, 0 to 2 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—30 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Camborthids, 0 to 2 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—7 percent
- Inclusion 2: Haplic Nadurargids, 0 to 2 percent slopes—Haplic Nadurargids, clayey, montmorillonitic, mesic, shallow—3 percent

### **Characteristics of the Beoska Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Loess over loamy and gravelly mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, pepperweed, Indian ricegrass, bottlebrush squirreltail, cheatgrass

### **Typical Profile**

0 to 13 inches—silt loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

- 13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
- 24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
- 55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid  
*Available water capacity:* 7.9 to 9.8 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

#### Characteristics of the Tenabo Soil

*Position on landscape:* Upper summits of fan piedmont remnants  
*Parent material:* A thin loess mantle influenced by volcanic ash over mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, pepperweed, cheatgrass

#### Typical Profile

0 to 13 inches—silt loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4

mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

- 13 to 20 inches—clay loam, gravelly clay loam, silty clay loam; 5 to 30 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 20 to 39 inches—indurated duripan; massive; very hard, very firm
- 39 to 60 inches or more—very gravelly loamy sand; 5 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to hardpan:* 9 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.8 to 4.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.55; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Fan drainageways  
*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

##### Inclusion 2

*Position on landscape:* Slightly dissected middle summits of fan piedmont remnants

*Contrasting features:* Strongly cemented duripan at a depth of 10 to 20 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability of the Beoska soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

*Suitability of the Tenabo soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

**Ratings and Restrictive Features of the Beoska Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess sodium

*Terraces and diversions:* Erodes easily

**Ratings and Restrictive Features of the Tenabo Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, seepage

*Embankments, dikes, and levees:* Severe—excess sodium, excess salt, seepage

*Drainage:* Deep to water

*Irrigation:* Cemented pan, erodes easily

*Terraces and diversions:* Cemented pan

**Interpretive Groups**

*Capability classification:* Beoska soil—IIIs, irrigated, and VIIs, nonirrigated; Tenabo soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Beoska soil—024X002N; Tenabo soil—024X002N

**173—Beoska-Tenabo silt loams, sloping****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Beoska silt loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—60 percent

- Tenabo silt loam, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—30 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Camborthids, 2 to 4 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—7 percent

- Inclusion 2: Haplic Nadurargids, 2 to 8 percent slopes—Haplic Nadurargids, clayey, montmorillonitic, mesic, shallow—3 percent

**Characteristics of the Beoska Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Loess over gravelly and loamy mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, pepperweed, Indian ricegrass, bottlebrush squirreltail, cheatgrass

**Typical Profile**

0 to 13 inches—silt loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH



8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid  
*Available water capacity:* 7.9 to 9.8 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Characteristics of the Tenabo Soil

*Position on landscape:* Upper summits of fan piedmont remnants  
*Parent material:* Thin loess mantle influenced by volcanic ash over mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, pepperweed, cheatgrass

### Typical Profile

0 to 13 inches—silt loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 13 to 20 inches—clay loam, gravelly clay loam, silty clay loam; 5 to 30 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 20 to 39 inches—indurated duripan; massive; very hard, very firm

39 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 5 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); single grained; loose; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 9 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.8 to 4.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.55; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fan drainageways  
*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Dissected middle summits of fan piedmont remnants  
*Contrasting features:* Clayey subsoil and a strongly cemented duripan at a depth of 10 to 20 inches  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland

### Wildlife habitat elements:

*Suitability of the Beoska soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

*Suitability of the Tenabo soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—

poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features of the Beoska Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Deep to water

*Irrigation:* Slope, erodes easily, excess sodium

*Terraces and diversions:* Erodes easily

### **Ratings and Restrictive Features of the Tenabo Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, seepage

*Embankments, dikes, and levees:* Severe—excess sodium, excess salt, seepage

*Drainage:* Deep to water

*Irrigation:* Slope, cemented pan, erodes easily

*Terraces and diversions:* Cemented pan

### **Interpretive Groups**

*Capability classification:* Beoska soil—IIIe, irrigated, and VIIs, nonirrigated; Tenabo soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Beoska soil—024X002N; Tenabo soil—024X002N

## **174—Beoska-Chiara association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Beoska silt loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—55 percent
- Chiara fine sandy loam, 2 to 8 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—30 percent

#### *Contrasting inclusions:*

- Inclusion 1: Xerollic Durargids, 2 to 8 percent slopes—Xerollic Durargids, loamy-skeletal, mixed, mesic, shallow—7 percent
- Inclusion 2: Durixerollic Camborthids, 0 to 4 percent slopes—Durixerollic Camborthids, fine-loamy, mixed, mesic—4 percent
- Inclusion 3: Tenabo silt loam, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—4 percent

### **Characteristics of the Beoska Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Loess over loamy and gravelly mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Indian ricegrass

### **Typical Profile**

0 to 13 inches—silt loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy

loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid  
*Available water capacity:* 7.9 to 9.8 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Characteristics of the Chiara Soil

*Position on landscape:* Shoulders and upper summits of fan piedmont remnants  
*Parent material:* Loess mantle high in volcanic ash over mixed alluvium  
*Slope features:* Length—short; shape—smooth to convex  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

### Typical Profile

0 to 5 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4  
 5 to 16 inches—very fine sandy loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 16 inches—indurated duripan; massive; extremely hard, very firm

### Soil and Water Features

*Depth to hardpan:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.4 to 2.8 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fan drainageways on upper fan piedmont remnants  
*Contrasting features:* Very gravelly subsoil over indurated duripan and receives additional soil moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Inset fans  
*Contrasting features:* Very deep soil, lacks a layer of clay accumulation, and receives additional soil moisture from runoff  
*Distinctive present vegetation:* Basin big sagebrush

#### Inclusion 3

*Position on landscape:* Smooth to slightly convex stable areas on summits of upper part of fan piedmont remnants  
*Contrasting features:* Loamy, sodium-affected subsoil over an indurated duripan at a depth less than 20 inches  
*Distinctive present vegetation:* Shadscale and bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Chiara soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Beoska Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Chiara Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan

*Pond reservoir areas:* Severe—cemented pan

*Embankments, dikes, and levees:* Severe—piping, thin layer

#### **Interpretive Groups**

*Capability classification:* Beoska soil—IIIe, irrigated, and VIIs, nonirrigated; Chiara soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Beoska soil—024X002N; Chiara soil—024X005N

### **175—Beoska-Jenor association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Beoska silt loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—50 percent
- Jenor very fine sandy loam, 0 to 2 percent slopes—Typic Durorthids, coarse-loamy, mixed, mesic—35 percent

*Contrasting inclusions:*

- Inclusion 1: Beoska silt loam, 2 to 4 percent slopes, occasionally flooded—Duric Natrargids, fine-loamy, mixed, mesic—7 percent
- Inclusion 2: Creemon very fine sandy loam, 2 to 4 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—4 percent
- Inclusion 3: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—4 percent

#### **Characteristics of the Beoska Soil**

*Position on landscape:* Shoulders and side slopes of fan piedmont remnants

*Parent material:* Loess over loamy and gravelly mixed alluvium

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Shadscale, bud sagebrush, pepperweed, bottlebrush squirreltail

#### **Typical Profile**

0 to 13 inches—silt loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 7.9 to 9.8 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Jenor Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Loess over loamy mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, pepperweed

### **Typical Profile**

0 to 6 inches—very fine sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR 2 to 10); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

6 to 16 inches—fine sandy loam; 0 to 5 percent cobbles and stones and 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-4

16 to 26 inches—fine sandy loam, sandy loam, gravelly loam; 0 to 5 percent cobbles and stones and 10 to 40 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4, A-2

26 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—2; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth foot slopes of fan piedmont remnants

*Contrasting features:* Receives additional soil moisture from runoff and shallow, low-velocity floods

*Distinctive present vegetation:* Winterfat, bud sagebrush, shadscale

#### **Inclusion 2**

*Position on landscape:* Smooth to slightly convex, lower inset fans

*Contrasting features:* Very deep soil with a silty subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Inclusion 3**

*Position on landscape:* Adjacent fan skirts

*Contrasting features:* Very deep soil with a silty subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Jenor soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Jenor Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Beoska soil—IIIe, irrigated, and

Vlls, nonirrigated; Jenor soil—IVs, irrigated, and Vlls, nonirrigated

*Range site:* Beoska soil—024X002N; Jenor soil—024X002N

## 177—Beoska-Oxcorel-McConnel association

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,500 to 5,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Beoska gravelly very fine sandy loam, 2 to 4 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—40 percent
- Oxcorel gravelly very fine sandy loam, 2 to 4 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—30 percent
- McConnel gravelly fine sandy loam, 2 to 4 percent slopes—Xerollic Camborthids, sandy-skeletal, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Haplargids, 4 to 8 percent slopes—Typic Haplargids, fine, montmorillonitic, mesic—5 percent
- Inclusion 2: Typic Camborthids, 2 to 4 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Xerollic Camborthids, 0 to 2 percent slopes—Xerollic Camborthids, fine-loamy, mixed, mesic—5 percent

### **Characteristics of the Beoska Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Loess over loamy and gravelly mixed alluvium

*Slope features:* Length—long; shape—slightly convex to smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 13 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; slightly hard, firm; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 7.0 to 8.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Upper summits of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth or slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less

than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4

5 to 20 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

20 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (less than 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 20 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 4.8 to 6.7 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

#### **Characteristics of the McConnel Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium influenced by loess and volcanic ash over gravelly mixed alluvium

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

#### **Typical Profile**

0 to 2 inches—gravelly fine sandy loam; 30 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-4

2 to 12 inches—loam, sandy loam, fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm);

nonsodic (SAR less than 2); estimated Unified classification—ML, SM; estimated AASHTO classification—A4

12 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones and 65 to 90 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid in the upper 12 inches; below this depth—very rapid

*Available water capacity:* 2.9 to 4.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Slightly dissected side slopes of fan piedmont remnants

*Contrasting features:* Clayey subsoil not affected by sodium, 4 to 8 percent slopes

*Distinctive present vegetation:* Shadscale, bud sagebrush

##### **Inclusion 2**

*Position on landscape:* Irregularly shaped fan skirts adjacent to lower part of fan piedmont

*Contrasting features:* Sandy loam subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

##### **Inclusion 3**

*Position on landscape:* Concave inset fan remnants

*Contrasting features:* Heavy loam subsoil

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the McConnel soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Oxcorel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones, excess sodium

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the McConnel Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—too sandy, area reclaim, small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Beoska soil—IIIe, irrigated, and VIIs, nonirrigated; Oxcorel soil—IVe, irrigated, and

VIIIs, nonirrigated; McConnel soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Beoska soil—024X002N; Oxcorel soil—024X002N; McConnel soil—024X020N

### **178—Beoska-Malpais-Old Camp association**

#### **Map Unit Setting**

*Position on landscape:* Hills and adjacent fan piedmonts

*Elevation:* 4,800 to 5,600 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Beoska very fine sandy loam, 4 to 8 percent slopes, extremely stony—Duric Natrargids, fine-loamy, mixed, mesic—35 percent
  - Malpais loam, 30 to 50 percent slopes, rubbly—Typic Camborthids, loamy-skeletal, mixed, mesic—30 percent
  - Old Camp very cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—20 percent
- Contrasting inclusions:*
- Inclusion 1: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—6 percent
  - Inclusion 2: Rock outcrop—4 percent
  - Inclusion 3: Puett sandy loam, 8 to 30 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—3 percent
  - Inclusion 4: Rubble land—2 percent

#### **Characteristics of the Beoska Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Loess over gravelly and loamy mixed alluvium

*Slope features:* Length—short; shape—slightly convex to slightly concave

*Dominant present vegetation:* Shadscale, bud sagebrush, spiny hopsage, small rabbitbrush, needleandthread

#### **Typical Profile**

0 to 13 inches—very fine sandy loam; 10 to 25 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4



- 13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
- 24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
- 55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft; very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid  
*Available water capacity:* 7.1 to 9.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

#### **Characteristics of the Malpais Soil**

*Position on landscape:* Dominantly south-facing toe slopes of hills  
*Parent material:* Mixed colluvium  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, shadscale, pine bluegrass, bluebunch wheatgrass, cheatgrass  
*Rock fragments on surface:* Kind—stones; percentage of surface covered—20

#### **Typical Profile**

0 to 3 inches—very gravelly loam; 10 to 20 percent cobbles and 50 to 65 percent pebbles (by weight);

platy structure; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2

3 to 15 inches—very gravelly loam, very cobbly fine sandy loam; 40 to 50 percent cobbles and stones or 65 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

15 to 60 inches or more—stratified extremely cobbly loam to extremely cobbly sandy loam; 40 to 50 percent cobbles and stones or 50 to 65 percent pebbles (by weight); massive; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.6 to 5.4 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

#### **Characteristics of the Old Camp Soil**

*Position on landscape:* North-facing side slopes, summits, and upper south-facing shoulder slopes of hills  
*Parent material:* Kind—residuum and colluvium influenced by volcanic ash; source—andesite  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, small rabbitbrush

#### **Typical Profile**

0 to 2 inches—very cobbly loam; 25 to 55 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, GM-GC, SM-SC; estimated AASHTO classification—A-4, A-2

2 to 14 inches—very stony loam, very cobbly clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.5 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave inset fans  
*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Scattered peaks on summits and shoulder slopes of hills

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* Barren

#### Inclusion 3

*Position on landscape:* Concave eroded side slopes of hills

*Contrasting features:* Soft bedrock at a depth of 10 to 20 inches

*Distinctive present vegetation:* Black sagebrush, bottlebrush squirreltail

#### Inclusion 4

*Position on landscape:* Side slopes of hills below Rock outcrop

*Contrasting features:* 100 percent stones and cobbles on the surface

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Malpais soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Beoska Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Ratings of the Malpais Soil for Selected Uses

*Range seeding:* Poor—large stones, erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

### Ratings of the Old Camp Soil for Selected Uses

*Range seeding:* Poor—large stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope, large stones

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

### Interpretive Groups

*Capability classification:* Beoska soil—VIIIs, nonirrigated;

Malpais soil—VIIIs, nonirrigated; Old Camp soil—VIIIs, nonirrigated

*Range site:* Beoska soil—024X002N; Malpais soil—024X026N; Old Camp soil—024X005N

## 181—Beoska-Orovada association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,600 to 5,900 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Beoska gravelly sandy loam, 2 to 4 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—60 percent
- Orovada fine sandy loam, 2 to 8 percent slopes, rarely flooded—Durixerollic Camborthids, coarse-loamy, mixed, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Haplargids, 2 to 8 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—7 percent
- Inclusion 2: Xerollic Camborthids, 2 to 4 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—4 percent
- Inclusion 3: Oxcorel very fine sandy loam, 0 to 4 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—4 percent

### Characteristics of the Beoska Soil

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Loess over loamy and gravelly mixed alluvium

*Slope features:* Length—long; shape—smooth to slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 13 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-1

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately

sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 6.8 to 7.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Characteristics of the Orovada Soil

*Position on landscape:* Inset fan remnants

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Sandberg bluegrass, phlox

### Typical Profile

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less

than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave side slopes of fan piedmont remnants

*Contrasting features:* Very gravelly subsoil and substratum

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Inset fans

*Contrasting features:* Gravelly sandy loam throughout the soil profile, receives additional soil moisture from runoff and from occasional floods

*Distinctive present vegetation:* Wyoming big sagebrush, basin big sagebrush, Thurber needlegrass

#### Inclusion 3

*Position on landscape:* Slightly higher summits of fan piedmont remnants

*Contrasting features:* Clayey, sodium-affected subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

### Wildlife habitat elements:

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings and Restrictive Features of the Beoska Soil for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Deep to water

*Irrigation:* Excess salt, excess sodium, slope

*Terraces and diversions:* Erodes easily

### Ratings and Restrictive Features of the Orovada Soil for Selected Uses and Practices

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Soil blowing, slope, erodes easily

*Terraces and diversions:* Erodes easily

### Interpretive Groups

*Capability classification:* Beoska soil—IIIe, irrigated, and VIIs, nonirrigated; Orovada soil—IIIe, irrigated, and VIc, nonirrigated

*Range site:* Beoska soil—024X002N; Orovada soil—024X020N

## 182—Beoska-Whirlo-Misad association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 4,500 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Beoska very fine sandy loam, 0 to 2 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—30 percent
- Whirlo silt loam, 0 to 2 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—30 percent
- Misad gravelly sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—25 percent

#### Contrasting inclusions:

- Inclusion 1: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—8 percent
- Inclusion 2: Duric Natrargids, 0 to 2 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—7 percent

### Characteristics of the Beoska Soil

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Loess over gravelly mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### Typical Profile

- 0 to 13 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
- 13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
- 24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
- 55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 7.5 to 9.4 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Characteristics of the Whirlo Soil

*Position on landscape:* Inset fan remnants

*Parent material:* Mixed alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### Typical Profile

- 0 to 12 inches—silt loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.1); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 12 to 24 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 15 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 4.9 to 6.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Misad Soil**

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium with some influence from loess high in volcanic ash  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-1, A-2  
 7 to 31 inches—stratified fine sandy loam to very gravelly sandy loam; 5 to 10 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2  
 31 to 60 inches or more—very gravelly loamy sand to extremely gravelly coarse sand; 5 to 10 percent cobbles and stones and 60 to 80 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 31 inches—moderately rapid; below this depth—rapid  
*Available water capacity:* 2.9 to 4.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—4  
*Hydrologic group:* B  
*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent to stream channels  
*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, shadscale

#### **Inclusion 2**

*Position on landscape:* Upper summits of fan piedmont remnants

*Contrasting features:* Strongly cemented duripan at a depth of 40 to 60 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Misad soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Poor—small stones, seepage

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Misad Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—seepage, small stones, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Beoska soil—IIIs, irrigated, and VIIs, nonirrigated; Whirlo soil—IIC, irrigated, and VIIc, nonirrigated; Misad soil—IIIs, irrigated, and VIIs, nonirrigated

*Range site:* Beoska soil—024X002N; Whirlo soil—024X002N; Misad soil—024X002N

### **183—Beoska-Dewar-Orovada association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,400 to 5,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Beoska very fine sandy loam, 4 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—40 percent
- Dewar gravelly loam, 2 to 8 percent slopes—Xerollic Durargids, loamy, mixed, mesic, shallow—30 percent
- Orovada gravelly very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Haplargids, 15 to 50 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 2: Xeric Torriorthents, 15 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—5 percent
- Inclusion 3: Duric Natrargids, 15 to 50 percent slopes—Duric Natrargids, loamy-skeletal, mixed, mesic—5 percent

#### **Characteristics of the Beoska Soil**

*Position on landscape:* Summits and shoulders on the lower part of fan piedmont remnants

*Parent material:* Loess over loamy and gravelly mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 13 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 7.7 to 9.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Dewar Soil**

*Position on landscape:* Summits on the upper parts of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 4 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC, CL; estimated AASHTO classification—A-6

4 to 14 inches—gravelly clay loam, gravelly silty clay loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7

14 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 13 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.7 to 2.1 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Orovada Soil**

*Position on landscape:* Inset fans

*Parent material:* Loess influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, Sandberg bluegrass, spiny hopsage

### **Typical Profile**

0 to 8 inches—gravelly very fine sandy loam; 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.2 to 9.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing side slopes of fan piedmont remnants

*Contrasting features:* Very deep soil with slopes of 15 to 50 percent

*Distinctive present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Slight concave side slopes of rock pediment remnants exposed by dissection of fan piedmonts

*Contrasting features:* Soft bedrock within a depth of 20 inches and slopes of 15 to 50 percent

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* South-facing side slopes of fan piedmont remnants



*Contrasting features:* Very deep soil with slopes of 15 to 50 percent

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Dewar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Dewar Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, cemented pan

*Pond reservoir areas:* Severe—cemented pan

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Orovada Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Beoska soil—IIIe, irrigated, and VIIs, nonirrigated; Dewar soil—IVe, irrigated, and VIIs, nonirrigated; Orovada soil—IIIe, irrigated, and VIc, nonirrigated

*Range site:* Beoska soil—024X002N; Dewar soil—024X005N; Orovada soil—028B010N

## **185—Beowawe silt loam**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,500 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Beowawe silt loam, 0 to 2 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

- Inclusion 2: Beoska silt loam, 0 to 2 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—5 percent

- Inclusion 3: Tenabo silt loam, 0 to 2 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—5 percent

### **Characteristics of the Beowawe Soil**

*Position on landscape:* Slightly dissected summits of fan piedmont remnants

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass

### **Typical Profile**

0 to 6 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 11 inches—loam, silt loam; 0 to 5 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

11 to 60 inches or more—coarse sandy loam, loam; 5 to 15 percent pebbles (by weight); massive; hard, very friable; strongly alkaline (pH 8.9); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 8.5 to 10.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Smooth inset fans  
*Contrasting features:* Coarser textured subsoil  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Smooth, undissected part of the fan piedmont  
*Contrasting features:* Finer textured subsoil  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Convex upper fan piedmont remnants  
*Contrasting features:* Indurated duripan within a depth of 20 inches  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—area reclaim, excess sodium  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—piping, excess sodium  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess sodium  
*Terraces and diversions:* Erodes easily

### Interpretive Groups

*Capability classification:* IIs, irrigated, and VIIs, nonirrigated  
*Range site:* 024X002N

## 192—Vanwyper-Trunk-Trunk, steep, association

### Map Unit Setting

*Position on landscape:* Mountains  
*Elevation:* 5,400 to 6,000 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 105 days

### Composition

#### Major components:

- Vanwyper cobbly loam, 15 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—40 percent
- Trunk cobbly clay loam, 4 to 15 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—25 percent
- Trunk cobbly clay loam, 15 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—20 percent

#### Contrasting inclusions:

- Inclusion 1: Rock outcrop—7 percent
- Inclusion 2: Aridic Haploxerolls, 4 to 8 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, mesic—3 percent
- Inclusion 3: Typic Camborthids, 2 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—3 percent

- Inclusion 4: Typic Durorthids, 8 to 15 percent slopes—Typic Durorthids, loamy, mixed, mesic, shallow—2 percent

### **Characteristics of the Vanwyper Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum; source—tuffaceous and volcanic rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Basin wildrye, Wyoming big sagebrush

*Surface cover:* 10 percent pebbles, 10 percent cobbles

### **Typical Profile**

0 to 7 inches—cobbly loam; 10 to 25 percent cobbles and stones and 15 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

7 to 22 inches—very cobbly clay, very cobbly clay loam; 30 to 55 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7

22 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.6 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Trunk Soil**

*Position on landscape:* Summits of mountains

*Parent material:* Kind—residuum and colluvium; source—sedimentary rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### **Typical Profile**

0 to 5 inches—cobbly clay loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); granular structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

5 to 28 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

28 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.0 to 3.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Trunk, Steep, Soil**

*Position on landscape:* West-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—sedimentary rocks

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### **Typical Profile**

0 to 5 inches—cobbly clay loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); granular structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

5 to 28 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure;

hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

28 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.0 to 3.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Small peaks and rimrock escarpments

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Upper drainageways

*Contrasting features:* Very deep soil that has a thick dark surface layer and receives additional soil moisture from runoff

*Distinctive present vegetation:* Mountain big sagebrush, antelope bitterbrush

#### Inclusion 3

*Position on landscape:* Lower drainageways and outwash fans

*Contrasting features:* Very deep soil with moderately salt- and sodium-affected substratum

*Distinctive present vegetation:* Shadscale, black greasewood

#### Inclusion 4

*Position on landscape:* South-facing, isolated, convex toe slopes of mountains

*Contrasting features:* Duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Vanwyper soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Trunk, steep, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Vanwyper Soil for Selected Uses

*Range seeding:* Poor—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, slope, shrink-swell

*Roadfill:* Poor—depth to bedrock, low strength, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—large stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

### Ratings of the Trunk Soil for Selected Uses

*Range seeding:* Fair—droughty, too arid

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—depth to bedrock, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Trunk, Steep, Soil for Selected Uses

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—depth to bedrock, low strength, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Vanwyper soil—VIIIs,

nonirrigated; Trunk soil—VIIIs, nonirrigated; Trunk, steep, soil—VIIe, nonirrigated

*Range site:* Vanwyper soil—024X028N; Trunk soil—024X005N; Trunk, steep, soil—024X005N

## 193—Berning-Alley association

### *Map Unit Setting*

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 5,500 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 110 days

### *Composition*

*Major components:*

- Berning extremely cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—45 percent
- Alley very gravelly loam, 15 to 30 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Malpais extremely gravelly loam, 30 to 50 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—8 percent
- Inclusion 2: Whirlo extremely gravelly sandy loam, 2 to 8 percent slopes, occasionally flooded—Typic Camborthids, loamy-skeletal, mixed, mesic—7 percent

### *Characteristics of the Berning Soil*

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Kind—alluvium; source—tuffaceous rocks

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass

*Surface cover:* 50 percent pebbles, 15 percent cobbles

### *Typical Profile*

0 to 9 inches—extremely cobbly loam; 50 to 70 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

9 to 40 inches—very gravelly clay loam, very gravelly clay, very gravelly sandy clay; 0 to 30 percent cobbles and stones and 60 to 75 percent pebbles (by weight); subangular blocky structure; hard, very friable; neutral (pH 7.2); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

40 to 60 inches or more—very gravelly sandy loam, extremely gravelly sandy clay loam; 20 to 40 percent cobbles and stones and 60 to 80 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

### *Soil and Water Features*

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 3.2 to 4.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### *Characteristics of the Alley Soil*

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass

### *Typical Profile*

0 to 7 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

7 to 26 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); blocky structure; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6

26 to 37 inches—gravelly loam, gravelly sandy loam; 0 to 10 percent cobbles and stones and 40 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly

saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2 37 to 60 inches or more—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 6.0 to 7.5 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Colluvial toe slopes of adjacent mountains  
*Contrasting features:* Low water-supplying capacity  
*Distinctive present vegetation:* Shadscale, Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Inset fans  
*Contrasting features:* Receives additional soil moisture from runoff and flooding, slope of 2 to 8 percent  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Berning soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Alley soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Berning Soil for Selected Uses

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—large stones

### Ratings of the Alley Soil for Selected Uses

*Range seeding:* Poor—small stones  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope, seepage  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Berning soil—VIIIs, nonirrigated; Alley soil—VIIIs, nonirrigated  
*Range site:* Berning soil—024X005N; Alley soil—024X005N

## 200—Sonoma Variant silt loam

### Map Unit Setting

*Position on landscape:* Basin floor remnants  
*Elevation:* 5,680 to 5,740 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 47 degrees F  
*Frost-free season:* About 100 days

### Composition

#### Major components:

- Sonoma Variant silt loam, 0 to 2 percent slopes—Typic Fluvaquents, coarse-silty, mixed (calcareous), mesic—95 percent

#### Contrasting inclusions:

- Inclusion 1: Sonoma silt loam, strongly saline, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

### Characteristics of the Sonoma Variant Soil

*Position on landscape:* Basin floor remnants  
*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Alkali bluegrass, rush

### Typical Profile

0 to 3 inches—silt loam; subangular blocky structure;

slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

3 to 60 inches or more—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to artesian water table:* 6 to 18 inches throughout the year

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Very slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly higher areas on adjacent alluvial flats

*Contrasting features:* Lower fluctuating water table and a finer textured substratum

*Distinctive present vegetation:* Black greasewood, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—very poor; domestic grasses and legumes (irrigated)—very poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—good; shallow water areas—good

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—wetness

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—wetness, frost action

*Roadfill:* Poor—wetness

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—wetness

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, wetness

*Drainage:* Frost action

*Irrigation:* Wetness, erodes easily, excess salt

*Terraces and diversions:* Erodes easily, wetness

### Interpretive Groups

*Capability classification:* Vw, irrigated, and Vw, nonirrigated

*Range site:* 024X043N

## 202—Bioya-Chiara-Cortez association

### Map Unit Setting

*Position on landscape:* Fan piedmont remnants

*Elevation:* 5,000 to 5,500 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Bioya very fine sandy loam, 2 to 8 percent slopes—Xerollic Durorthids, fine-loamy, mixed, mesic—40 percent

- Chiara very fine sandy loam, 2 to 8 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—35 percent

- Cortez very fine sandy loam, 8 to 15 percent slopes—Xerollic Nadurargids, fine, montmorillonitic, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Natrargids, 4 to 8 percent slopes—Xerollic Natrargids, fine, montmorillonitic, mesic—5 percent

- Inclusion 2: Kelk silt loam, 0 to 2 percent slopes, occasionally flooded—Durixerollic Camborthids, fine-silty, mixed, mesic—5 percent

### Characteristics of the Bioya Soil

*Position on landscape:* Crests and side slopes of lower fan piedmont remnants

*Parent material:* Kind—loess capped alluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Sandberg bluegrass

### Typical Profile

0 to 11 inches—very fine sandy loam; 0 to 5 percent

pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

11 to 38 inches—silt loam, loam; 0 to 5 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-6, A-4

38 to 60 inches or more—indurated duripan; massive; very hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 6.1 to 8.0 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Chiara Soil**

*Position on landscape:* Shoulders and crests of higher fan piedmont remnants

*Parent material:* Loess mantle high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, rabbitbrush, spiny hopsage

### **Typical Profile**

0 to 5 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 16 inches—very fine sandy loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

16 inches—indurated duripan; massive; extremely hard, very firm

### **Soil and Water Features**

*Depth to hardpan:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.5 to 2.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.55; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Cortez Soil**

*Position on landscape:* Side slopes of upper fan piedmont remnants

*Parent material:* Thin deposits of loess over mixed alluvium

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 12 inches—very fine sandy loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

12 to 26 inches—clay, gravelly clay, silty clay; 15 to 40 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CH; estimated AASHTO classification—A-7

26 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 22 to 36 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.4 to 4.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—3



*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Toe slopes of fan piedmont remnants

*Contrasting features:* Very deep soil

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Inset fans

*Contrasting features:* Very deep soil that receives additional soil moisture from runoff

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Bioya soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Chiara soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cortez soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Bioya Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Moderate—cemented pan, frost action

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—cemented pan, thin layer

*Pond reservoir areas:* Moderate—slope, seepage, cemented pan

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Chiara Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan

*Pond reservoir areas:* Severe—cemented pan

*Embankments, dikes, and levees:* Severe—piping, thin layer

#### **Ratings of the Cortez Soil for Selected Uses**

*Range seeding:* Poor—excess sodium

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, cemented pan, excess sodium

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer, hard to pack, excess sodium

### **Interpretive Groups**

*Capability classification:* Bioya soil—IIIe, irrigated, and VIIs, nonirrigated; Chiara soil—IVe, irrigated, and VIIs, nonirrigated; Cortez soil—IVe, irrigated, and VIs, nonirrigated

*Range site:* Bioya soil—024X005N; Chiara soil—024X005N; Cortez soil—024X005N

## **203—Bioya-Shabliss-Puett association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 5,500 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Bioya very fine sandy loam, 2 to 8 percent slopes—Xerollic Durorthids, fine-loamy, mixed, mesic—55 percent
  - Shabliss very fine sandy loam, 2 to 8 percent slopes—Haploxerollic Durorthids, loamy, mixed, mesic, shallow—15 percent
  - Puett gravelly sandy loam, 15 to 30 percent slopes, very stony—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—15 percent
- Contrasting inclusions:**
- Inclusion 1: Rock outcrop—5 percent
  - Inclusion 2: Xeric Torriorthents, 0 to 8 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—4 percent
  - Inclusion 3: Kelk silt loam, 0 to 2 percent slopes,

occasionally flooded—Durixerollic Camborthids, fine-silty, mixed, mesic—4 percent

• Inclusion 4: Shabliss stony loam, 8 to 15 percent slopes—Haploxerollic Durorthids, loamy, mixed, mesic, shallow—2 percent

### **Characteristics of the Bioya Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Kind—loess capped alluvium; source—volcanic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

### **Typical Profile**

0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

11 to 38 inches—silt loam, loam; 0 to 5 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-6, A-4

38 to 60 inches or more—indurated duripan; massive; very hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 6.1 to 8.0 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Shabliss Soil**

*Position on landscape:* Shoulders of fan piedmont remnants

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Thurber needlegrass,

Wyoming big sagebrush, bluebunch wheatgrass

*Surface cover:* 10 percent pebbles, 4 percent cobbles

### **Typical Profile**

0 to 6 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 16 inches—very fine sandy loam, loam, silt loam; 0 to 5 percent cobbles and stones and 0 to 5 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

16 to 34 inches—strongly cemented duripan; platy structure; very hard, very firm

34 to 60 inches or more—loamy sand, gravelly loamy sand; 0 to 5 percent cobbles and stones and 20 to 40 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.7 to 3.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—3

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Puett Soil**

*Position on landscape:* Side slopes of fan piedmont remnants with a core of soft rock

*Parent material:* Kind—residuum; source—tuffaceous rocks

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Indian ricegrass, Wyoming big sagebrush, black sagebrush

*Surface cover:* 25 percent pebbles, 10 percent cobbles, 2 percent stones

### Typical Profile

0 to 4 inches—gravelly sandy loam; 5 to 10 percent cobbles and 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2

4 to 15 inches—coarse sandy loam, gravelly sandy loam, loam; 10 to 50 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML, GM; estimated AASHTO classification—A-1, A-2, A-4

15 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 1.7 to 2.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Exposed bedrock cores on eroded side slopes of fan piedmont remnants

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Toe slopes of fan piedmont remnants

*Contrasting features:* Very deep

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Inset fans

*Contrasting features:* Silty throughout the soil profile, occasionally flooded

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush, black greasewood

#### Inclusion 4

*Position on landscape:* Upper side slopes of fan piedmont remnants

*Contrasting features:* Slopes of 8 to 15 percent and stony surface layer

*Distinctive present vegetation:* Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Bioya soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Shabliss soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Puett soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### Ratings of the Bioya Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Moderate—cemented pan, frost action

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—cemented pan, thin layer

*Pond reservoir areas:* Moderate—slope, seepage, cemented pan

*Embankments, dikes, and levees:* Severe—piping

#### Ratings of the Shabliss Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty, cemented pan

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan

*Pond reservoir areas:* Severe—seepage, cemented pan

*Embankments, dikes, and levees:* Severe—piping

#### Ratings of the Puett Soil for Selected Uses

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—seepage, piping

### **Interpretive Groups**

*Capability classification:* Bioya soil—IIIe, irrigated, and VIIs, nonirrigated; Shabliss soil—IVe, irrigated, and VIIs, nonirrigated; Puett soil—VIIe, nonirrigated

*Range site:* Bioya soil—024X005N; Shabliss soil—024X005N; Puett soil—025X025N

## **211—Blacka very fine sandy loam, 0 to 2 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,500 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Blacka very fine sandy loam, 0 to 2 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—4 percent

- Inclusion 2: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—4 percent

- Inclusion 3: Orovada fine sandy loam, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—4 percent

- Inclusion 4: Jenor very fine sandy loam, 0 to 2 percent slopes—Typic Durorthids, coarse-loamy, mixed, mesic—3 percent

### **Characteristics of the Blacka Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Loess over mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, kochia, globemallow, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—very fine sandy loam; prismatic

structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 2 to 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 21 inches—fine sandy loam, very fine sandy loam; prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

21 to 31 inches—strongly cemented duripan; massive; very hard, very firm

31 to 60 inches or more—stratified sandy loam to loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to hardpan:* 20 to 26 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—3; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower inset fans

*Contrasting features:* Very deep soils

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth fan skirts bordering lower edge of fan piedmonts

*Contrasting features:* Very deep soil that has a silty subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Smooth higher inset fans

*Contrasting features:* Very deep soils that receive additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 4**

*Position on landscape:* Smooth upper part of fan piedmont remnants

*Contrasting features:* Indurated duripan

*Distinctive present vegetation:* Shadscale, bud sagebrush

*Other inclusions of minor extent:* Concave and smooth inset fans that receive additional soil moisture from runoff and occasional flooding, supporting winterfat and Indian ricegrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Moderate—cemented pan

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—cemented pan, thin layer

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Cemented pan, erodes easily

*Terraces and diversions:* Cemented pan, erodes easily

**Interpretive Groups**

*Capability classification:* IVs, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

**212—Blacka-Broyles very fine sandy loams, 2 to 8 percent slopes****Map Unit Setting**

*Position on landscape:* Intricately mingled fan piedmonts and fan skirts

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition****Major components:**

- Blacka very fine sandy loam, 2 to 8 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—45 percent
- Broyles very fine sandy loam, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—40 percent

**Contrasting inclusions:**

- Inclusion 1: Jenor very fine sandy loam, 0 to 2 percent slopes—Typic Durorthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Soolake very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, sandy, mixed, mesic—5 percent

**Characteristics of the Blacka Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Loess over mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, Kochia, globemallow, bottlebrush squirreltail

**Typical Profile**

0 to 8 inches—very fine sandy loam; prismatic structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 2 to 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 21 inches—fine sandy loam, very fine sandy loam; prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

21 to 31 inches—strongly cemented duripan; massive; very hard, very firm

31 to 60 inches or more—stratified sandy loam to loam; massive; slightly hard, very friable; moderately alkaline (pH 8.4); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to hardpan:* 20 to 26 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 2.9 to 3.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.49; T value—3; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Characteristics of the Broyles Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Loess over mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, kochia, bottlebrush squirreltail

### **Typical Profile**

0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 2 to 10); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; hard, friable; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 6.3 to 7.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth upper summits of fan piedmont remnants

*Contrasting features:* Indurated duripan  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth inset fans  
*Contrasting features:* Very deep soil that receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Lower margins of fan skirts  
*Contrasting features:* Sandy throughout the soil profile  
*Distinctive present vegetation:* Black greasewood, shadscale

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### **Wildlife habitat elements:**

*Suitability of the Blacka soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Suitability of the Broyles soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

### **Ratings and Restrictive Features of the Blacka Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Poor—cemented pan  
*Shallow excavations:* Moderate—cemented pan  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—cemented pan, thin layer  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Slope, cemented pan, erodes easily  
*Terraces and diversions:* Cemented pan, erodes easily

### **Ratings and Restrictive Features of the Broyles Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Fair—too sandy, small stones  
*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—piping  
*Drainage:* Deep to water  
*Irrigation:* Excess salt, slope, erodes easily  
*Terraces and diversions:* Erodes easily, too sandy

### **Interpretive Groups**

*Capability classification:* Blacka soil—IVe, irrigated, and VIIs, nonirrigated; Broyles soils—IIIe, irrigated, and VIIc, nonirrigated  
*Range site:* Blacka soil—024X002N; Broyles soil—024X002N

## **213—Blacka-Broyles very fine sandy loams, saline, 2 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Intricately mingled fan piedmonts and fan skirts  
*Elevation:* 4,400 to 5,000 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Blacka very fine sandy loam, strongly saline, 2 to 4 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—60 percent
- Broyles very fine sandy loam, strongly saline, 2 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—30 percent

*Contrasting inclusions:*

- Inclusion 1: Antel silt loam, 2 to 4 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent
- Inclusion 2: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—3 percent
- Inclusion 3: Wholan very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—2 percent

### **Characteristics of the Blacka Soil**

*Position on landscape:* Nonburied fan piedmont remnants  
*Parent material:* Loess capped mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, shadscale, seepweed

### **Typical Profile**

0 to 8 inches—very fine sandy loam; prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 8 to 21 inches—fine sandy loam, very fine sandy loam; prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
 21 to 31 inches—strongly cemented duripan; massive; very hard, very firm  
 31 to 60 inches or more—stratified sandy loam to loam; massive; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—SM; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to hardpan:* 20 to 26 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 2.9 to 3.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.49; T value—3; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Broyles Soil**

*Position on landscape:* Fan skirts and inset fans intricately mingled with nonburied fan piedmont remnants  
*Parent material:* Loess capped mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, shadscale, seepweed

### **Typical Profile**

0 to 5 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 11 inches—silt loam, very fine sandy loam, fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; hard, friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 6.3 to 7.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Remnants of fan skirts

*Contrasting features:* Nonsaline or slightly saline surface layer and a finer textured substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Remnants of inset fans

*Contrasting features:* Nonsaline or slightly saline surface layer

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Convex fan aprons overplacing fan piedmont remnants

*Contrasting features:* Soils are nonsaline throughout and receive shallow, low-velocity flooding in spring

*Distinctive present vegetation:* Winterfat, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

### Wildlife habitat elements:

*Suitability of the Blacka soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

*Suitability of the Broyles soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### Ratings and Restrictive Features of the Blacka Soil for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Moderate—cemented pan

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

*Drainage:* Deep to water

*Irrigation:* Cemented pan, slope, erodes easily

*Terraces and diversions:* Cemented pan, erodes easily

### Ratings and Restrictive Features of the Broyles Soil for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, slope

*Terraces and diversions:* Erodes easily, too sandy

### Interpretive Groups

*Capability classification:* Blacka soil—VIs, irrigated, and VIIs, nonirrigated; Broyles soil—VIs, irrigated, and VIIs, nonirrigated



*Range site:* Blacka soil—024X003N; Broyles soil—024X003N

## **220—Blackhawk very fine sandy loam, 2 to 8 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,800 to 5,200 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Blackhawk very fine sandy loam, 2 to 8 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—85 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Xeric Torrifluvents, 2 to 8 percent slopes—Durorthidic Xeric Torrifluvents, sandy-skeletal, mixed, mesic—10 percent
- Inclusion 2: Broyles very fine sandy loam, moderately saline, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—3 percent
- Inclusion 3: Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—2 percent

### **Characteristics of the Blackhawk Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Loamy mixed alluvium influenced by loess

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

- 0 to 8 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 8 to 14 inches—loam, very fine sandy loam, silt loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 14 to 17 inches—strongly cemented duripan; massive; extremely hard, extremely firm
- 17 to 38 inches—stratified sandy loam to extremely

gravelly loamy coarse sand; 10 to 30 percent pebbles (by weight); massive; slightly hard, friable; very strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

38 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 50 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—GP-GM, GP, SP-SM, SP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Range in depth to hardpan:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the hardpan—moderate; below the hardpan—very rapid

*Available water capacity:* 2.2 to 2.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth to slightly concave, upper inset fans and areas adjacent to channels

*Contrasting features:* Very deep soil that receives additional soil moisture from runoff and occasional flooding

*Distinctive present vegetation:* Basin big sagebrush

#### **Inclusion 2**

*Position on landscape:* Adjacent fan skirts

*Contrasting features:* Very deep soils

*Distinctive present vegetation:* Shadscale, black greasewood

#### **Inclusion 3**

*Position on landscape:* Concave lower broad inset fans

*Contrasting features:* Very deep soil that receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Blackhawk Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan, area reclaim

*Pond reservoir areas:* Severe—seepage, cemented pan

*Embankments, dikes, and levees:* Severe—seepage, excess salt

**Interpretive Groups**

*Capability classification:* IVE, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

**230—Broyles very fine sandy loam, 0 to 2 percent slopes**

**Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—4 percent
- Inclusion 2: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—3 percent
- Inclusion 3: Weso fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—3 percent
- Inclusion 4: Blacka very fine sandy loam, 0 to 2 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—5 percent

**Characteristics of the Broyles Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess over mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, kochia, bottlebrush squirreltail

**Typical Profile**

0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; hard, friable; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 6.3 to 7.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* Smooth lower part of adjacent alluvial flats near flood-plain playas

*Contrasting features:* Calcareous throughout and moderately well drained

*Distinctive present vegetation:* Black greasewood, shadscale

**Inclusion 2**

*Position on landscape:* Adjacent inset fans

*Contrasting features:* Silty throughout

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 3**

*Position on landscape:* Smooth lower margin of fan skirts adjacent to alluvial flats

*Contrasting features:* A continuous weakly cemented subhorizon in the upper 40 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 4**

*Position on landscape:* Smooth adjacent fan piedmont remnants

*Contrasting features:* A strongly cemented duripan at a depth of 20 to 26 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

#### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Septic tank absorption fields:* Slight

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Excess salt

*Terraces and diversions:* Erodes easily, too sandy

### **Interpretive Groups**

*Capability classification:* IIs, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

## **231—Broyles very fine sandy loam, 2 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

• Broyles very fine sandy loam, 2 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—85 percent

#### **Contrasting inclusions:**

- Inclusion 1: Blacka very fine sandy loam, 2 to 4 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Creemon silt loam, 2 to 4 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent
- Inclusion 3: Orovada fine sandy loam, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent

### **Characteristics of the Broyles Soil**

*Position on landscape:* Margins of fan skirts

*Parent material:* Loess over loamy mixed alluvium

*Slope features:* Length—long; shape—gently undulating

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

- 0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 2 to 10); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; hard, friable; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 6.3 to 7.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth upper fan skirt remnants

*Contrasting features:* A duripan at a depth of 20 to 26 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Undulating fan skirts adjacent to alluvial flats near old channels

*Contrasting features:* Silty throughout

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Adjacent concave inset fans

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

#### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Excess salt, erodes easily

*Terraces and diversions:* Erodes easily, too sandy

### **Interpretive Groups**

*Capability classification:* IIe, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

## **232—Broyles very fine sandy loam, cemented substratum, 0 to 2 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Broyles very fine sandy loam, cemented substratum, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 2: Blacka very fine sandy loam, 0 to 2 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—5 percent

- Inclusion 3: Jenor very fine sandy loam, 0 to 2 percent slopes—Typic Durorthids, coarse-loamy, mixed, mesic—5 percent

### **Characteristics of the Broyles Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, spiny hopsage, horsebrush

### **Typical Profile**

0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

11 to 28 inches—sandy loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR 5 to 10); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

28 to 45 inches—stratified loamy sand to loamy fine sand; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-2

45 to 60 inches or more—strongly cemented duripan; massive; very hard, very firm

### Soil and Water Features

*Depth to hardpan:* 40 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 4.7 to 5.9 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—3; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Lower margins of fan skirts  
*Contrasting features:* Strongly saline surface layer and a finer textured substratum  
*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 2

*Position on landscape:* Adjacent nonburied fan piedmont remnants  
*Contrasting features:* A duripan at a depth of 20 to 26 inches  
*Distinctive present vegetation:* Shadscale, bud sagebrush, Indian ricegrass

#### Inclusion 3

*Position on landscape:* Adjacent nonburied fan piedmont remnants  
*Contrasting features:* Indurated duripan at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Shadscale, bud sagebrush, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt  
*Daily cover for landfill:* Fair—cemented pan, thin layer  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight

*Roadfill:* Fair—thin layer  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—piping  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

### Interpretive Groups

*Capability classification:* IIs, irrigated, and VIIc, nonirrigated  
*Range site:* 024X002N

## 233—Broyles very fine sandy loam, moderately saline, 0 to 2 percent slopes

### Map Unit Setting

*Position on landscape:* Fan skirts  
*Elevation:* 4,400 to 5,600 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### Composition

#### Major components:

• Broyles very fine sandy loam, moderately saline, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—85 percent

#### Contrasting inclusions:

• Inclusion 1: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent  
 • Inclusion 2: Creemon silt loam, strongly saline, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent  
 • Inclusion 3: Raglan silty clay loam, moderately saline, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—5 percent

### Characteristics of the Broyles Soil

*Position on landscape:* Fan skirts  
*Parent material:* Loess over loamy mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, shadscale, bud sagebrush, seepweed

### Typical Profile

0 to 5 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13)

to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 11 inches—silt loam, very fine sandy loam, fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 6.3 to 7.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Adjacent undulating recent alluvial flat remnants near channels

*Contrasting features:* Calcareous surface layer

*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 2

*Position on landscape:* Adjacent smooth inset fans

*Contrasting features:* Silty throughout

*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 3

*Position on landscape:* Margins of fan skirts adjacent to smooth alluvial flats

*Contrasting features:* Finer textured substratum

*Distinctive present vegetation:* Black greasewood, shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Septic tank absorption fields:* Slight

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Excess salt, erodes easily

*Terraces and diversions:* Erodes easily

### Interpretive Groups

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X003N

## 235—Broyles-Creemon association

### Map Unit Setting

*Position on landscape:* Fan skirts and inset fans

*Elevation:* 5,000 to 5,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Broyles silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—45 percent
- Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—7 percent
- Inclusion 2: Duric Natrargids, 0 to 2 percent slopes—

Duric Natrargids, fine-loamy, mixed, mesic—6 percent  
 • Inclusion 3: Xerollic Camborthids, 0 to 2 percent  
 slopes—Xerollic Camborthids, loamy-skeletal, mixed,  
 mesic—2 percent

### **Characteristics of the Broyles Soil**

*Position on landscape:* Upper part of fan skirts  
*Parent material:* Loess over loamy mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud  
 sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 11 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; hard, friable; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 6.3 to 7.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Characteristics of the Creemon Soil**

*Position on landscape:* Lower part of fan skirts and inset fans  
*Parent material:* Silty mixed alluvium influenced by volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—silt loam; platy structure; soft, very

friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

7 to 18 inches—silt loam, very fine sandy loam; subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

18 to 60 inches or more—stratified very fine sandy loam to silt loam; massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 10.1 to 12.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent to stream channels on lower margins of fan skirts  
*Contrasting features:* Strongly salt- and sodium-affected surface layer  
*Distinctive present vegetation:* Shadscale, black greasewood

#### **Inclusion 2**

*Position on landscape:* Summits of adjacent fan piedmont remnants  
*Contrasting features:* Clay loam subsoil  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Adjacent to stream channels on inset fans  
*Contrasting features:* Receives additional soil moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

#### Wildlife habitat elements:

*Suitability of the Broyles soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Creemon soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Broyles Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

#### Ratings of the Creemon Soil for Selected Uses

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

### Interpretive Groups

*Capability classification:* Broyles soil—IIs, irrigated, and VIIe, nonirrigated; Creemon soil—IIC, irrigated, and VIIc, nonirrigated

*Range site:* Broyles soil—024X002N; Creemon soil—024X002N

## 237—Broyles-Beoska-Orovada association

### Map Unit Setting

*Position on landscape:* Piedmont slope

*Elevation:* 5,000 to 5,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

• Broyles very fine sandy loam, 2 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—40 percent

• Beoska very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—30 percent

• Orovada fine sandy loam, 2 to 8 percent slopes, rarely flooded—Durixerollic Camborthids, coarse-loamy, mixed, mesic—20 percent

#### Contrasting inclusions:

• Inclusion 1: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

• Inclusion 2: Typic Nadurargids, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—5 percent

### Characteristics of the Broyles Soil

*Position on landscape:* Fan skirts

*Parent material:* Loess over mixed alluvium

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 2 to 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; hard, friable; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 6.3 to 7.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low



### **Characteristics of the Beoska Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 13 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); moderately saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 7.7 to 9.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Orovada Soil**

*Position on landscape:* Inset fans

*Parent material:* Loess influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—concave to smooth

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

#### **Typical Profile**

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent to concave, irregularly shaped, active channels

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

## **Inclusion 2**

*Position on landscape:* Convex, slightly higher summits of fan piedmont remnants

*Contrasting features:* An indurated duripan at a depth of less than 20 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

## **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Broyles soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Broyles Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

### **Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Ratings of the Orovada Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

## **Interpretive Groups**

*Capability classification:* Broyles soil—IIe, irrigated, and VIIc, nonirrigated; Beoska soil—IIIe, irrigated, and VIIs, nonirrigated; Orovada soil—IIIe, irrigated, and VIc, nonirrigated

*Range site:* Broyles soil—024X002N; Beoska soil—024X002N; Orovada soil—024X020N

## **240—Bubus very fine sandy loam**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,500 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—8 percent
- Inclusion 2: Rosney silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—4 percent
- Inclusion 3: Playas—3 percent

### **Characteristics of the Bubus Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Mixed alluvium high in pyroclastics

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, black greasewood, bottlebrush squirreltail

### **Typical Profile**

- 0 to 6 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 6 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately

sodic (SAR 40 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 9.0 to 10.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Smooth outer margins of alluvial flat remnants

*Contrasting features:* Finer textured throughout  
*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 2

*Position on landscape:* Adjacent to channels on smooth alluvial flat remnants

*Contrasting features:* Finer textured throughout  
*Distinctive present vegetation:* Saltbush, Indian ricegrass

#### Inclusion 3

*Position on landscape:* Low, smooth, irregularly shaped depressions and basins on alluvial flats

*Contrasting features:* Pondered  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

### Interpretive Groups

*Capability classification:* IIs, irrigated, and VIIs, nonirrigated  
*Range site:* 024X003N

## 242—Bubus very fine sandy loam, gravelly substratum

### Map Unit Setting

*Position on landscape:* Alluvial flats  
*Elevation:* 4,400 to 5,000 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### Composition

#### Major components:

- Bubus very fine sandy loam, gravelly substratum, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—85 percent

#### Contrasting inclusions:

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Misad gravelly sandy loam, saline-sodic, 0 to 2 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 3: Playas—5 percent

### Characteristics of the Bubus Soil

*Position on landscape:* Alluvial flat remnants  
*Parent material:* Loamy mixed alluvium high in pyroclastics over gravelly mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, shadscale, bud sagebrush

### Typical Profile

0 to 6 inches—very fine sandy loam; 0 to 10 percent

pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 40 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

40 to 60 inches or more—stratified very gravelly sand to extremely gravelly loamy coarse sand; 60 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—GP-GM, SP-SM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 40 inches—moderate; below this depth—very rapid

*Available water capacity:* 6.6 to 7.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—4; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Alluvial flat remnants

*Contrasting features:* Finer textured substratum

*Distinctive present vegetation:* Black greasewood, shadscale

##### Inclusion 2

*Position on landscape:* Adjacent to channels and narrow inset fans dissecting alluvial flats

*Contrasting features:* Very gravelly throughout the soil profile

*Distinctive present vegetation:* Black greasewood, shadscale

##### Inclusion 3

*Position on landscape:* Scattered, irregularly shaped sink areas

*Contrasting features:* Ponded water for long periods

*Distinctive present vegetation:* Barren

#### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

#### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Septic tank absorption fields:* Moderate—percs slowly

*Daily cover for landfill:* Fair—thin layer

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—low strength

*Roadfill:* Fair—low strength

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

*Drainage:* Deep to water

*Irrigation:* Excess sodium, excess salt, erodes easily

*Terraces and diversions:* Erodes easily

#### Interpretive Groups

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X003N

### 243—Bubus-Playas complex

#### Map Unit Setting

*Position on landscape:* Basin floors

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### Composition

*Major components:*

- Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—55 percent

- Playas—30 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—

Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—10 percent

- Inclusion 2: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent

### **Characteristics of the Bubus Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Mixed alluvium high in pyroclastics

*Slope features:* Length—long; shape—smooth to undulating

*Dominant present vegetation:* Black greasewood, shadscale

### **Typical Profile**

0 to 6 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 9.0 to 10.2 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Playas**

*Position on landscape:* Small basins and depressions

*Parent material:* Lacustrine deposits overlaced in some places by a thin layer of alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Barren

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Alluvial flat remnants adjacent to playas

*Contrasting features:* Finer textured substratum

*Distinctive present vegetation:* Black greasewood, shadscale

#### **Inclusion 2**

*Position on landscape:* Adjacent fan skirt remnants

*Contrasting features:* Nonsaline in the upper 20 or 30 inches

*Distinctive present vegetation:* Saltbush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### **Wildlife habitat elements:**

*Suitability of the Bubus soil for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features of the Bubus Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Septic tank absorption field:* Moderate—percs slowly

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* Bubus soil—IIs, irrigated, and VIIs, nonirrigated; Playas—VIIIw

*Range site:* Bubus soil—024X003N

## **244—Bubus-Relley complex**

### **Map Unit Setting**

*Position on landscape:* Fan skirts and alluvial flats

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Bubus gravelly loam, slightly saline, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—50 percent
- Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—40 percent

#### *Contrasting inclusions:*

- Inclusion 1: Hessian silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Wholan silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—5 percent

### **Characteristics of the Bubus Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Mixed alluvium high in pyroclastics

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush

#### **Typical Profile**

0 to 6 inches—gravelly loam; 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-4

6 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.9 to 10.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Relley Soil**

*Position on landscape:* Fan skirts

*Parent material:* Kind—silty alluvium influenced by loess and volcanic ash; source—volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush

#### **Typical Profile**

0 to 8 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

8 to 16 inches—silt loam; 0 to 5 percent pebbles (by weight); prismatic structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

16 to 28 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

28 to 60 inches or more—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 20 to 30); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 10.8 to 12.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Fan skirt remnants

*Contrasting features:* Gravelly substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 2**

*Position on landscape:* Smooth inset fans dissecting alluvial flat remnants

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Winterfat

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability of the Bubus soil for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

*Suitability of the Relley soil for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—fair

**Ratings and Restrictive Features of the Bubus Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

**Ratings and Restrictive Features of the Relley Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Fair—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* Bubus soil—IIs, irrigated, and VIIs, nonirrigated; Relley soil—IIC, irrigated, and VIIc, nonirrigated

*Range site:* Bubus soil—024X002N; Relley soil—024X002N

**245—Bubus-Needle Peak-Yipor association****Map Unit Setting**

*Position on landscape:* Inset fans and alluvial flats

*Elevation:* 4,600 to 4,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 50 degrees F

*Frost-free season:* About 110 days

**Composition****Major components:**

- Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—40 percent
- Needle Peak silt loam, 0 to 2 percent slopes, occasionally flooded—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—25 percent
- Yipor very fine sandy loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—20 percent

**Contrasting inclusions:**

- Inclusion 1: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—10 percent
- Inclusion 2: Typic Torriorthents, 0 to 4 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

**Characteristics of the Bubus Soil**

*Position on landscape:* Slightly rilled alluvial flat remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, black greasewood, seepweed

**Typical Profile**

0 to 6 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); strongly saline (16 to 25 mmhos/cm); slightly sodic (SAR 13)

to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 6 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 9.0 to 10.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Needle Peak Soil**

*Position on landscape:* Inset fans  
*Parent material:* Silty mixed alluvium with some influence from loess and volcanic ash  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Black greasewood, basin big sagebrush, rubber rabbitbrush, basin wildrye

### **Typical Profile**

0 to 9 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7  
 9 to 49 inches—silt loam; subangular blocky structure; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7  
 49 to 60 inches or more—sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* In January through May—48 to 72 inches; rest of year—below 72 inches

*Frequency of flooding:* Frequency—occasional; duration—brief; months—March through June  
*Permeability:* Moderately slow  
*Available water capacity:* 10.9 to 12.1 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* High

### **Characteristics of the Yipor Soil**

*Position on landscape:* Inset fan remnants  
*Parent material:* Silty mixed alluvium with a component of loess  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Black greasewood, shadscale, basin wildrye, sickle saltbush

### **Typical Profile**

0 to 16 inches—very fine sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 16 to 60 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* 9.3 to 11.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth fan skirts  
*Contrasting features:* Rarely flooded, well drained soils



*Distinctive present vegetation:* Shadscale, black greasewood

#### **Inclusion 2**

*Position on landscape:* Dunes superimposed on alluvial flats

*Contrasting features:* Severe wind erosion hazard

*Distinctive present vegetation:* Shadscale, black greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Bubus soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Needle Peak soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Yipor soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Bubus Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

#### **Ratings of the Needle Peak Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Fair—too clayey

*Shallow excavations:* Moderate—wetness, flooding

*Local roads and streets:* Severe—low strength, frost action, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Moderate—thin layer, piping

#### **Ratings of the Yipor Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

### **Interpretive Groups**

*Capability classification:* Bubus soil—VIs, irrigated, and VIIs, nonirrigated; Needle Peak soil—IIw, irrigated, and VIw, nonirrigated; Yipor soil—IIc, irrigated, and VIIc, nonirrigated

*Range site:* Bubus soil—024X003N; Needle Peak soil—024X006N; Yipor soil—024X012N

## **247—Bubus-Isolde association**

### **Map Unit Setting**

*Position on landscape:* Lake plains

*Elevation:* 4,600 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—65 percent

- Isolde fine sand, 4 to 30 percent slopes—Typic Torripsamments, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Entic Durorthids, 0 to 2 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—5 percent

- Inclusion 2: Aquic Durorthidic Torriorthents, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 3: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Bubus Soil**

*Position on landscape:* Interdune areas of lake plain terraces

*Parent material:* Loess over mixed alluvium high in pyroclastics

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, black greasewood, seepweed, spiny horsebrush

**Typical Profile**

0 to 6 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 9.0 to 10.2 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

**Characteristics of the Isolde Soil**

*Position on landscape:* Partially stabilized sand dunes on lake plain terraces

*Parent material:* Kind—eolian sands; source—various kinds of rock

*Slope features:* Length—short; shape—undulating

*Dominant present vegetation:* Spiny hopsage, black greasewood, bud sagebrush, shadscale, Indian ricegrass

**Typical Profile**

0 to 7 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

7 to 60 inches or more—fine sand, sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* 3.6 to 5.4 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—moderate; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Adjacent nonburied fan skirt remnants

*Contrasting features:* Strongly cemented duripan within a depth of 20 inches

*Distinctive present vegetation:* Shadscale, black greasewood

**Inclusion 2**

*Position on landscape:* Higher part of lake plain near springs

*Contrasting features:* Poorly drained soils, silty throughout soil profile

*Distinctive present vegetation:* Black greasewood, seepweed

**Inclusion 3**

*Position on landscape:* Lowest portion of lake plains

*Contrasting features:* Somewhat poorly drained, silty throughout soil profile

*Distinctive present vegetation:* Black greasewood, basin wildrye

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Bubus soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Isolde soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings of the Bubus Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt, excess sodium  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt

#### **Ratings of the Isolde Soil for Selected Uses**

*Range seeding:* Too arid, too sandy, soil blowing  
*Daily cover for landfill:* Poor—seepage, too sandy, slopes  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Probable source  
*Gravel:* Improbable source—too sandy  
*Topsoil:* Poor—too sandy, slope  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—seepage, piping

#### **Interpretive Groups**

*Capability classification:* Bubus soil—IIs, irrigated, and VIIs, nonirrigated; Isolde soil—VIIs, nonirrigated  
*Range site:* Bubus soil—024X003N; Isolde soil—027X016N

### **248—Bubus-Batan-Reese association**

#### **Map Unit Setting**

*Position on landscape:* Basin floor  
*Elevation:* 4,500 to 4,700 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

#### **Composition**

##### *Major components:*

- Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—45 percent
- Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—25 percent
- Reese silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—20 percent

##### *Contrasting inclusions:*

- Inclusion 1: Aquic Durorthidic Torriorthents, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-loamy, mixed (calcareous), mesic—8 percent
- Inclusion 2: Aquic Torriorthents, 0 to 2 percent slopes—Aquic Torriorthents, fine-loamy, mixed (calcareous), mesic—2 percent

#### **Characteristics of the Bubus Soil**

*Position on landscape:* Alluvial flats remnants  
*Parent material:* Mixed alluvium high in pyroclastics  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, seepweed, black greasewood, littleleaf horsebrush

#### **Typical Profile**

0 to 6 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 25 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 6 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 42); estimated Unified classification—ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 9.0 to 10.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

#### **Characteristics of the Batan Soil**

*Position on landscape:* Stream terraces  
*Parent material:* Kind—loess influenced silty alluvium; source—volcanic rock high in pyroclastics  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, black greasewood, littleleaf horsebrush, seepweed, bottlebrush squirreltail

#### **Typical Profile**

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 5 to 68 inches or more—stratified silt loam to silty clay

loam; massive; hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Characteristics of the Reese Soil

*Position on landscape:* Irregularly shaped flood plains  
*Parent material:* Kind—loamy alluvium; source—volcanic rock  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Black greasewood, seepweed, shadscale

### Typical Profile

0 to 9 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 9 to 60 inches or more—stratified silt loam to silty clay loam; massive; hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### Soil and Water Features

*Depth to seasonal high water table:* In March through July—18 to 36 inches; rest of year—below 36 inches  
*Frequency of flooding:* Frequency—occasional; duration—brief or long; months—April through May  
*Permeability:* Slow  
*Available water capacity:* 9.2 to 12.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Backfilled flood plain channels  
*Contrasting features:* Somewhat poorly drained and moderately salt and sodium affected throughout the soil profile  
*Distinctive present vegetation:* Shadscale, black greasewood

#### Inclusion 2

*Position on landscape:* Adjacent to irregularly shaped flood plain channels  
*Contrasting features:* Frequently flooded  
*Distinctive present vegetation:* Basin big sagebrush, black greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Bubus soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Batan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Reese soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

#### Ratings of the Bubus Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt

#### Ratings of the Batan Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Good

*Shallow excavations:* Slight  
*Local roads and streets:* Severe—low strength  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt, excess sodium  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Reese Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium  
*Daily cover for landfill:* Poor—excess sodium  
*Shallow excavations:* Severe—wetness  
*Local roads and streets:* Severe—low strength, flooding, frost action  
*Roadfill:* Fair—low strength, shrink-swell, wetness  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess sodium, excess salt  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—wetness, excess sodium, excess salt

#### **Interpretive Groups**

*Capability classification:* Bubus soil—IIs, irrigated, and VIIs, nonirrigated; Batan soil—IIIs, irrigated, and VIIs, nonirrigated; Reese soil—VIIw, nonirrigated  
*Range site:* Bubus soil—024X003N; Batan soil—024X003N; Reese soil—024X011N

### **251—Bucan-Bucan, steep, association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 5,200 to 5,500 feet  
*Average annual precipitation:* About 10 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 90 days

#### **Composition**

##### *Major components:*

- Bucan cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—60 percent
- Bucan very cobbly loam, 15 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—25 percent

##### *Contrasting inclusions:*

- Inclusion 1: Humdun silt loam, 30 to 50 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, frigid—10 percent
- Inclusion 2: Rock outcrop—5 percent

#### **Characteristics of the Bucan Soil**

*Position on landscape:* Lower side slopes of mountains

*Parent material:* Kind—residuum and colluvium capped with loess high in volcanic ash; source—volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass, Thurber needlegrass

*Surface cover:* 15 percent pebbles

#### **Typical Profile**

0 to 5 inches—cobbly loam; 20 to 25 percent cobbles and stones and 20 to 30 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 23 inches—clay; 0 to 10 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH; estimated AASHTO classification—A-7

23 to 42 inches—cobbly clay, gravelly clay loam, gravelly clay; 10 to 30 percent cobbles and stones and 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-7

42 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 7.2 to 8.0 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.20; T value—3; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

#### **Characteristics of the Bucan, Steep, Soil**

*Position on landscape:* Upper side slopes of mountains

*Parent material:* Kind—residuum and colluvium capped with loess high in volcanic ash; source—volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, bluebunch wheatgrass, Thurber needlegrass

### Typical Profile

- 0 to 5 inches—very cobbly loam; 25 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6
- 5 to 30 inches—clay; 0 to 10 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH; estimated AASHTO classification—A-7
- 30 to 52 inches—cobbly clay, gravelly clay loam, gravelly clay; 10 to 30 percent cobbles and stones and 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-7
- 52 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 40 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 7.2 to 8.0 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—3; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* North-facing, concave side slopes of mountains  
*Contrasting features:* Lacks a layer of clay accumulation  
*Distinctive present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

#### Inclusion 2

*Position on landscape:* Scattered peaks on mountains

*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Bucan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Bucan, steep, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Bucan Soil for Selected Uses

*Range seeding:* Fair—too arid, large stones  
*Daily cover for landfill:* Poor—large stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—low strength, shrink-swell, slope  
*Roadfill:* Poor—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, too clayey  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—large stones

### Ratings of the Bucan, Steep, Soil for Selected Uses

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—large stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—low strength, shrink-swell, slope  
*Roadfill:* Poor—low strength, shrink-swell, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, too clayey  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—large stones

### Interpretive Groups

*Capability classification:* Bucan soil—VIIs, nonirrigated; Bucan, steep, soil—VIIs, nonirrigated  
*Range site:* Bucan soil—024X005N; Bucan, steep, soil—024X028N

## 252—Bucan-Humdun-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Mountains  
*Elevation:* 5,000 to 5,800 feet

*Average annual precipitation:* About 10 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 90 days

### **Composition**

#### *Major components:*

- Bucan cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—50 percent
- Humdun silt loam, 15 to 30 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, frigid—20 percent
- Rock outcrop—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Lithic Xerollic Haplargids, 2 to 8 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—5 percent
- Inclusion 2: Aridic Haploxerolls, 2 to 8 percent slopes—Aridic Haploxerolls, coarse-loamy, mixed, frigid—5 percent

### **Characteristics of the Bucan Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium capped with loess high in volcanic ash; source—volcanic rock

*Slope features:* Length—long to short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, basin wildrye, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—cobbly loam; 20 to 25 percent cobbles and stones and 20 to 30 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 15 inches—clay; 0 to 10 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH; estimated AASHTO classification—A-7

15 to 42 inches—cobbly clay, gravelly clay loam, gravelly clay; 10 to 30 percent cobbles and stones and 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-7

42 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 7.2 to 8.0 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—3; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Humdun Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—loess high in volcanic ash over colluvium and residuum; source—mostly extrusive volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, basin wildrye, bottlebrush squirreltail

### **Typical Profile**

0 to 6 inches—silt loam; platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 24 inches—loam, very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

24 to 60 inches or more—loam, very fine sandy loam, silt loam; massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 10.3 to 12.1 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Rimrock and scattered peaks on mountains  
*Dominant present vegetation:* Barren

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests of mountains  
*Contrasting features:* Bedrock within a depth of 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Foot slopes adjacent to mountain drainageways

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, mountain big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Bucan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Humdun soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Bucan Soil for Selected Uses**

*Range seeding:* Fair—too arid, large stones  
*Daily cover for landfill:* Poor—large stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, too clayey  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Humdun Soil for Selected Uses**

*Range seeding:* Poor—erodes easily  
*Daily cover for landfill:* Poor—slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Bucan soil—VIIs, nonirrigated; Humdun soil—VIe, nonirrigated; Rock outcrop—VIIIs  
*Range site:* Bucan soil—024X005N; Humdun soil—024X005N

## **262—Chen-Slaven-Chen, cobbly, association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,000 to 7,000 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 90 days

### **Composition**

#### *Major components:*

- Chen very gravelly loam, 4 to 15 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—40 percent
- Slaven loam, 15 to 30 percent slopes, very stony—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—25 percent
- Chen cobbly loam, 15 to 30 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Cumulic Haploxerolls, 2 to 8 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, frigid—6 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Cumulic Haplaquolls, 0 to 4 percent slopes—Cumulic Haplaquolls, loamy-skeletal, mixed, frigid—2 percent
- Inclusion 4: Pachic Haploxerolls, 15 to 30 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent

### **Characteristics of the Chen Soil**

*Position on landscape:* Crests of mountains  
*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—volcanic rocks  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, rabbitbrush, Sandberg bluegrass



### Typical Profile

0 to 10 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

10 to 16 inches—very cobbly clay, very gravelly clay, extremely gravelly clay; 0 to 45 percent cobbles and stones and 55 to 75 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7

16 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 1.1 to 1.7 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Slaven Soil

*Position on landscape:* Middle and lower side slopes of mountains

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—chert, shale, and quartzite

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Sandberg bluegrass, bottlebrush squirreltail

*Rock fragments on surface:* Kind—stones; percentage of surface covered—2

### Typical Profile

0 to 5 inches—loam; 10 to 25 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 22 inches—extremely gravelly clay, extremely gravelly sandy clay, extremely gravelly clay loam; 75 to 85 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

22 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.0 to 2.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Chen, Cobbly, Soil

*Position on landscape:* Upper side slopes of mountains

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—volcanic rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, rabbitbrush, Sandberg bluegrass

### Typical Profile

0 to 8 inches—cobbly loam; 20 to 25 percent cobbles and stones and 20 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

8 to 17 inches—very cobbly clay, very gravelly clay, extremely gravelly clay; 5 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

17 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow  
*Available water capacity:* 1.7 to 2.0 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent to mountain drainageways  
*Contrasting features:* Receives additional soil moisture from runoff  
*Distinctive present vegetation:* Basin big sagebrush

#### **Inclusion 2**

*Position on landscape:* Scattered peaks of mountains  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Toe slopes of mountains adjacent to seeps and springs  
*Contrasting features:* Receives additional soil moisture from runoff and lateral flow from seeps and springs  
*Distinctive present vegetation:* Tufted hairgrass, alpine timothy

#### **Inclusion 4**

*Position on landscape:* North-facing side slopes of mountains  
*Contrasting features:* Thick, dark colored surface layer and receives additional soil moisture from drifted snow  
*Distinctive present vegetation:* Snowberry, Idaho fescue

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, recreation

#### **Wildlife habitat elements:**

*Suitability of the Chen soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Slaven soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Chen, cobbly, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Chen Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, too clayey

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Slaven Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, too clayey, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Chen, Cobbly, Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, too clayey

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones, thin layer

### **Interpretive Groups**

*Capability classification:* Chen soil—VIIIs, nonirrigated; Slaven soil—VIIIs, nonirrigated; Chen, cobbly, soil—VIIIs, nonirrigated

*Range site:* Chen soil—024X027N; Slaven soil—025X014N; Chen, cobbly, soil—024X027N

## **272—Cherry Spring-Enko association**

### **Map Unit Setting**

*Position on landscape:* Piedmont slope

*Elevation:* 5,000 to 5,500 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Cherry Spring very fine sandy loam, 2 to 8 percent slopes—Haploxerollic Durargids, fine-loamy, mixed, mesic—50 percent
- Enko very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—40 percent

#### Contrasting inclusions:

- Inclusion 1: Cortez very fine sandy loam, 2 to 4 percent slopes—Xerollic Nadurargids, fine, montmorillonitic, mesic—5 percent
- Inclusion 2: Kelk silt loam, 0 to 2 percent slopes, occasionally flooded—Durixerollic Camborthids, fine-silty, mixed, mesic—5 percent

### Characteristics of the Cherry Spring Soil

*Position on landscape:* Fan piedmont remnants

*Parent material:* Loess influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

#### Typical Profile

- 0 to 7 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 7 to 29 inches—loam, silt loam, clay loam; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); subangular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6
- 29 to 41 inches—strongly cemented duripan
- 41 to 60 inches or more—stratified sandy loam to extremely gravelly sandy loam; 0 to 5 percent cobbles and stones and 35 to 65 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to hardpan:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—moderately rapid

*Available water capacity:* 4.8 to 5.6 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Enko Soil

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

#### Typical Profile

- 0 to 7 inches—very fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 7 to 15 inches—loam, sandy loam, fine sandy loam; 0 to 15 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
- 15 to 60 inches or more—sandy loam, loam, fine sandy loam; 0 to 25 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-2, A-4

#### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.4 to 8.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Summits of upper fan piedmont remnants

*Contrasting features:* Clayey subsoil and an indurated duripan

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Inset fans

*Contrasting features:* Receives additional soil moisture from runoff and flooding

*Distinctive present vegetation:* Wyoming big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Cherry Spring soil for named elements:*  
 Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Enko soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Cherry Spring Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Moderate—cemented pan, low strength, shrink-swell

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Enko Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Cherry Spring soil—IIIe, irrigated, and VIIs, nonirrigated; Enko soil—IVe, irrigated, and VI, nonirrigated

*Range site:* Cherry Spring soil—024X005N; Enko soil—024X005N

## **282—Chiara-Orovada association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Chiara very fine sandy loam, 2 to 8 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—50 percent

- Orovada very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Chiara very stony very fine sandy loam, 2 to 8 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—5 percent

- Inclusion 2: Goldrun fine sand, 2 to 8 percent slopes—Xeric Torripsamments, mixed, mesic—5 percent

### **Characteristics of the Chiara Soil**

*Position on landscape:* Slightly dissected fan piedmont remnants

*Parent material:* Loess mantle high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Indian ricegrass, pine bluegrass

### **Typical Profile**

0 to 5 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 16 inches—very fine sandy loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm);

nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

16 inches—indurated duripan; massive; extremely hard, very firm

### Soil and Water Features

*Depth to hardpan:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.5 to 2.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.55; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Orovada Soil

*Position on landscape:* Inset fans

*Parent material:* Loess influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—slightly concave to slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Indian ricegrass, spiny hopsage

### Typical Profile

0 to 8 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Adjacent fan collars

*Contrasting features:* Stony surface layer

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

#### Inclusion 2

*Position on landscape:* Sand sheets overplacing fan piedmont remnants

*Contrasting features:* Sandy throughout the soil profile

*Distinctive present vegetation:* Wyoming big sagebrush, needleandthread

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Chiara soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Chiara Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan

*Pond reservoir areas:* Severe—cemented pan

*Embankments, dikes, and levees:* Severe—piping, thin layer

#### Ratings of the Orovada Soil for Selected Uses

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, thin layer

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Chiara soil—Ive, irrigated, and VIIs, nonirrigated; Orovada soil—IIle, irrigated, and VIc, nonirrigated

*Range site:* Chiara soil—024X005N; Orovada soil—024X005N

## **283—Chiara-Tenabo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 5,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Chiara very fine sandy loam, 4 to 15 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—50 percent

- Tenabo very fine sandy loam, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—40 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, fine-loamy, mixed, mesic—7 percent

- Inclusion 2: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—3 percent

### **Characteristics of the Chiara Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium capped with loess high in volcanic ash

*Slope features:* Length—short; shape—smooth to slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, small rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2);

estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 16 inches—very fine sandy loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

16 inches—indurated duripan; massive; extremely hard, very firm

### **Soil and Water Features**

*Depth to hardpan:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.5 to 2.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.55; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Tenabo Soil**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium capped with loess high in volcanic ash

*Slope features:* Length—short; shape—smooth to convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 6 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 18 inches—clay loam, gravelly clay loam, silty clay loam; 5 to 30 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

18 to 40 inches—indurated duripan; massive; very hard, very firm

40 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 5 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 9 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.8 to 4.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.55; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave inset fan remnants  
*Contrasting features:* Very deep soil that receives additional soil moisture from runoff  
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### Inclusion 2

*Position on landscape:* Adjacent to active channels on inset fans  
*Contrasting features:* Very deep soil that receives additional soil moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, basin big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Chiara soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Tenabo soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Chiara Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty  
*Daily cover for landfill:* Poor—cemented pan  
*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan  
*Roadfill:* Poor—cemented pan  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—cemented pan  
*Pond reservoir areas:* Severe—cemented pan, slope  
*Embankments, dikes, and levees:* Severe—piping, thin layer

#### Ratings of the Tenabo Soil for Selected Uses

*Range seeding:* Poor—too arid, excess sodium  
*Daily cover for landfill:* Poor—cemented pan, seepage, too sandy  
*Shallow excavations:* Severe—cemented pan, cutbanks cave  
*Local roads and streets:* Severe—cemented pan  
*Roadfill:* Poor—cemented pan  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—cemented pan, small stones, too sandy  
*Pond reservoir areas:* Severe—cemented pan, seepage  
*Embankments, dikes, and levees:* Severe—excess sodium, excess salt, seepage

### Interpretive Groups

*Capability classification:* Chiara soil—IVe, irrigated, and VIIs, nonirrigated; Tenabo soil—IVe, irrigated, and VIIs, nonirrigated  
*Range site:* Chiara soil—024X005N; Tenabo soil—024X002N

## 284—Chiara-Dewar association

### Map Unit Setting

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,900 to 6,200 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 105 days

### Composition

#### Major components:

- Chiara gravelly loam, 2 to 8 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—55 percent
  - Dewar gravelly loam, 2 to 8 percent slopes—Xerollic Durargids, loamy, mixed, mesic, shallow—30 percent
- Contrasting inclusions:*
- Inclusion 1: Orovida gravelly loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—10 percent
  - Inclusion 2: Duric Camborthids, 8 to 15 percent slopes—Duric Camborthids, loamy-skeletal, mixed, mesic—3 percent
  - Inclusion 3: Typic Durargids, 2 to 8 percent slopes—

Typic Durargids, loamy, mixed, mesic, shallow—2 percent

### **Characteristics of the Chiara Soil**

*Position on landscape:* Lower fan piedmont remnants

*Parent material:* Loess mantle high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, small rabbitbrush, phlox

### **Typical Profile**

0 to 5 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

5 to 16 inches—very fine sandy loam, silt loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

16 inches—indurated duripan; massive; very hard, very firm

### **Soil and Water Features**

*Depth to hardpan:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.4 to 2.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Dewar Soil**

*Position on landscape:* Upper fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—slightly convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, small rabbitbrush, phlox

### **Typical Profile**

0 to 4 inches—gravelly loam; 0 to 5 percent cobbles

and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC, CL; estimated AASHTO classification—A-6

4 to 14 inches—gravelly silty clay loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7

14 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 13 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.8 to 2.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex inset fans

*Contrasting features:* Very deep soils

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### **Inclusion 2**

*Position on landscape:* Convex scarps on the lower margins of fan piedmont remnants

*Contrasting features:* Very deep soils that have very gravelly profiles

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Convex slightly raised positions on summits of fan piedmont remnants

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat



**Wildlife habitat elements:**

*Suitability of the Chiara soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Dewar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Chiara Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan

*Pond reservoir areas:* Severe—cemented pan

*Embankments, dikes, and levees:* Severe—piping, thin layer

**Ratings of the Dewar Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, cemented pan

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—piping

**Interpretive Groups**

*Capability classification:* Chiara soil—Vle, irrigated, and VIIs, nonirrigated; Dewar soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Chiara soil—028B010N; Dewar soil—028B010N

**285—Chiara-Trunk-Midraw association****Map Unit Setting**

*Position on landscape:* Hills and adjacent fan piedmonts

*Elevation:* 5,200 to 6,000 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 105 days

**Composition**

*Major components:*

- Chiara very gravelly loam, 4 to 15 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—40 percent

- Trunk cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—30 percent

- Midraw very cobbly loam, 15 to 30 percent slopes—Xerollic Durargids, clayey, montmorillonitic, mesic, shallow—15 percent

*Contrasting inclusions:*

- Inclusion 1: Aridic Haploxerolls, 15 to 30 percent slopes—Aridic Haploxerolls, coarse-loamy, mixed, frigid—5 percent

- Inclusion 2: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

- Inclusion 3: Durixerollic Camborthids, 15 to 30 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

**Characteristics of the Chiara Soil**

*Position on landscape:* Dissected summits, shoulders and side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium capped by loess high in volcanic ash

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, spiny hopsage, small rabbitbrush, bluebunch wheatgrass, invading Utah juniper

**Typical Profile**

0 to 5 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

5 to 16 inches—very fine sandy loam, silt loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

16 inches—indurated duripan; massive; extremely hard, very firm

**Soil and Water Features**

*Depth to hardpan:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.4 to 2.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Trunk Soil**

*Position on landscape:* Crests and east-, west-, and south-facing side slopes of hills

*Parent material:* Kind—colluvium and residuum; source—andesite and rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, spiny hopsage, bluebunch wheatgrass, small rabbitbrush, scattered Utah juniper

### **Typical Profile**

0 to 5 inches—cobbly loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); granular; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

5 to 28 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

28 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.0 to 3.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Midraw Soil**

*Position on landscape:* South-facing side slopes of hills

*Parent material:* Kind—residuum and colluvium

influenced by loess and volcanic ash; source—rhyolite, andesite, and tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, mountain big sagebrush, basin wildrye, Thurber needlegrass, invading Utah juniper

### **Typical Profile**

0 to 6 inches—very cobbly loam; 30 to 40 percent cobbles and stones and 30 to 60 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-2

6 to 16 inches—gravelly clay, gravelly clay loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-7

16 to 31 inches—indurated duripan

31 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 22 to 35 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave, north-facing side slopes of hills

*Contrasting features:* Deep soils with a thick, dark surface layer

*Distinctive present vegetation:* Mountain big sagebrush, snowberry

#### **Inclusion 2**

*Position on landscape:* Concave inset fans

*Contrasting features:* Very deep soils that receive additional soil moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Inclusion 3**

*Position on landscape:* Concave, north-facing side slopes of fan piedmont remnants

*Contrasting features:* Very deep soils that have slopes of 15 to 30 percent

*Distinctive present vegetation:* Mountain big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Chiara soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Midraw soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Chiara Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—piping, thin layer

### **Ratings of the Trunk Soil for Selected Uses**

*Range seeding:* Fair—droughty, too arid, large stones

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—depth to bedrock, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Midraw Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—cemented pan, slope, small stones

*Shallow excavations:* Severe—cemented pan, slope, depth to bedrock

*Local roads and streets:* Severe—cemented pan, slope, shrink-swell

*Roadfill:* Poor—depth to bedrock, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones, too clayey

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Chiara soil—IVs, irrigated, and VIIs, nonirrigated; Trunk soil—VIIe, nonirrigated;

Midraw soil—VIIs, nonirrigated

*Range site:* Chiara soil—024X005N; Trunk soil—024X005N; Midraw soil—024X028N

## **286—Chiara-Jenor association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 5,600 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Chiara fine sandy loam, 2 to 8 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—45 percent

- Jenor fine sandy loam, 2 to 8 percent slopes—Typic Durorthids, coarse-loamy, mixed, mesic—40 percent

#### **Contrasting inclusions:**

- Inclusion 1: Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—10 percent

- Inclusion 2: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

### **Characteristics of the Chiara Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Loamy mixed alluvium capped by loess high in volcanic ash

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, pine bluegrass, spiny hopsage

### **Typical Profile**

0 to 5 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—SM; estimated AASHTO classification—A-4

5 to 16 inches—very fine sandy loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

16 inches—indurated duripan; massive; extremely hard, very firm

### Soil and Water Features

*Depth to hardpan:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.4 to 2.8 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Jenor Soil

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Loamy mixed alluvium influenced by loess

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 6 inches—fine sandy loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4

6 to 16 inches—fine sandy loam, loam; 0 to 5 percent cobbles and stones and 5 to 25 percent pebbles (by weight); subangular blocky structure; soft, very hard, friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-4

16 to 26 inches—fine sandy loam, sandy loam, gravelly loam; 0 to 5 percent cobbles and stones and 10 to 40 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline

(8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4, A-2

26 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### Soil and Water Features

*Depth to hardpan:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 2.9 to 3.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave inset fan remnants and fan drainageways

*Contrasting features:* Very deep soils

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### Inclusion 2

*Position on landscape:* Concave inset fans

*Contrasting features:* Very deep soils that receive additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, basin big sagebrush, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Chiara soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Jenor soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Chiara Soil for Selected Uses

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Local roads and streets:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan

*Pond reservoir areas:* Severe—cemented pan

*Embankments, dikes, and levees:* Severe—piping, thin layer

#### **Ratings of the Jenor Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—cemented pan, seepage

*Embankments, dikes, and levees:* Severe—piping, area reclaim

#### **Interpretive Groups**

*Capability classification:* Chiara soil—Ive, irrigated, and VIIs, nonirrigated; Jenor soil—IIle, irrigated, and VIIs, nonirrigated

*Range site:* Chiara soil—024X005N; Jenor soil—024X002N

### **290—Creemon silt loam, 0 to 2 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent
- Inclusion 3: Wholan very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—5 percent

#### **Characteristics of the Creemon Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Indian ricegrass

#### **Typical Profile**

0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 45 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 45 inches—moderate; below this depth—moderately rapid

*Available water capacity:* 9.7 to 11.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Smooth upper margins of fan skirts

*Contrasting features:* Fine sandy loam throughout the soil profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth lower margins of fan skirts adjacent to alluvial flats

*Contrasting features:* Finer textured throughout the soil profile

*Distinctive present vegetation:* Shadscale and bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Adjacent smooth insert fans and fan drainageways

*Contrasting features:* Lacks layer of silica cementation and receives additional soil moisture from shallow, low-velocity runoff

*Distinctive present vegetation:* Winterfat, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt

*Septic tank absorption fields:* Moderate—percs slowly

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

## **291—Creemon silt loam, 2 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Creemon silt loam, 2 to 4 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 2 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—4 percent

- Inclusion 2: Whirlo silt loam, 2 to 4 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—3 percent

- Inclusion 3: Wholan stony fine sandy loam, 2 to 4 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—3 percent

### **Characteristics of the Creemon Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Indian ricegrass

### **Typical Profile**

0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 45 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent

pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 45 inches—moderate; below this depth—moderately rapid  
*Available water capacity:* 9.7 to 11.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Smooth upper margins of fan skirts  
*Contrasting features:* Fine sandy loam throughout the soil profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Smooth fan drainageways and adjacent to channels on inset fans  
*Contrasting features:* Very gravelly substrata  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Adjacent smooth inset fans  
*Contrasting features:* Stones cover about 1 percent of the surface  
*Distinctive present vegetation:* Winterfat, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—thin layer  
*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess salt, slope  
*Terraces and diversions:* Erodes easily

### Interpretive Groups

*Capability classification:* IIe, irrigated, and VIIc, nonirrigated  
*Range site:* 024X002N

## 292—Creemon silt loam, 0 to 2 percent slopes, occasionally flooded

### Map Unit Setting

*Position on landscape:* Inset fans  
*Elevation:* 4,400 to 5,000 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### Composition

#### Major components:

- Creemon silt loam, 0 to 2 percent slopes, occasionally flooded—Duric Camborthids, coarse-silty, mixed, mesic—85 percent

#### Contrasting inclusions:

- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent
- Inclusion 3: Wholan very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—5 percent

### Characteristics of the Creemon Soil

*Position on landscape:* Inset fans  
*Parent material:* Silty mixed alluvium influenced by volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Winterfat, saltbush, bud sagebrush, Indian ricegrass, bottlebrush squirreltail

**Typical Profile**

- 0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 10 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 15 to 28 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 28 to 60 inches or more—stratified very fine sandy loam to silt loam; massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

**Soil and Water Features**

- Depth to seasonal high water table:* More than 60 inches
- Frequency of flooding:* Frequency—occasional; duration—very brief; months—February through June
- Permeability:* Moderate
- Available water capacity:* 11.4 to 12.6 inches
- Water-supplying capacity:* 7 inches
- Runoff:* Slow
- Hydrologic group:* B
- Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5
- Hazard of erosion:* By water—slight; by wind—slight
- Shrink-swell potential:* Low
- Corrosivity:* To steel—high; to concrete—moderate
- Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Smooth higher margins adjacent to fan skirts

*Contrasting features:* Fine sandy loam throughout the soil profile

*Distinctive present vegetation:* Shadscale, bud sagebrush, Indian ricegrass

**Inclusion 2**

*Position on landscape:* Smooth lower margins adjacent to fan skirts

*Contrasting features:* Finer textured subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 3**

*Position on landscape:* Smooth inset fans adjacent to channels

*Contrasting features:* Lacks layer of silica accumulation and receives additional soil moisture from shallow, low-velocity runoff

*Distinctive present vegetation:* Winterfat, bud sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily, flooding

*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* IIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X014N

**293—Creemon silt loam, strongly saline, 0 to 2 percent slopes****Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days



## Composition

### Major components:

- Creemon silt loam, strongly saline, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—85 percent

### Contrasting inclusions:

- Inclusion 1: Batan silt loam, slightly saline, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—10 percent
- Inclusion 2: Broyles very fine sandy loam, moderately saline, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

## Characteristics of the Creemon Soil

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, spiny hopsage

## Typical Profile

- 0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 10 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 15 to 45 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46 to 55); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46 to 55); estimated Unified classification—SM; estimated AASHTO classification—A-4

## Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 45 inches—moderate; below this depth—moderately rapid

*Available water capacity:* 9.7 to 11.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

## Contrasting Inclusions

### Inclusion 1

*Position on landscape:* Smooth alluvial flat remnants at lower margins of fan skirts

*Contrasting features:* Surface layer is slightly saline and soil is moderately well drained

*Distinctive present vegetation:* Shadscale, bud sagebrush, Indian ricegrass

### Inclusion 2

*Position on landscape:* Upper part of fan skirts

*Contrasting features:* Fine sandy loam throughout the soil profile

*Distinctive present vegetation:* Black greasewood, shadscale

## Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

## Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Excess salt, erodes easily

*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* IIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X003N

**294—Creemon-Orovada-Broyles association****Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,500 to 5,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Creemon very fine sandy loam, 2 to 4 percent slopes, occasionally flooded—Duric Camborthids, coarse-silty, mixed, mesic—30 percent
- Orovada very fine sandy loam, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—30 percent
- Broyles very fine sandy loam, 2 to 4 percent slopes, frequently flooded—Duric Camborthids, coarse-loamy, mixed, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Haplargids, 4 to 8 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—10 percent
- Inclusion 2: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

**Characteristics of the Creemon Soil**

*Position on landscape:* Lower fan skirts

*Parent material:* Mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Winterfat, bud sagebrush, halogeton, bottlebrush squirreltail

**Typical Profile**

- 0 to 10 inches—very fine sandy loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 10 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 28 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

28 to 60 inches or more—stratified very fine sandy loam to silt loam; massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Frequency—occasional; duration—very brief; months—February through June

*Permeability:* Moderate

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

**Characteristics of the Orovada Soil**

*Position on landscape:* Fan skirt remnants

*Parent material:* Loess influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, bottlebrush squirreltail

**Typical Profile**

- 0 to 8 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
- 20 to 60 inches or more—stratified fine sandy loam to

silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 8.4 to 9.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Broyles Soil

*Position on landscape:* Upper fan skirts  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth to slightly convex  
*Dominant present vegetation:* Winterfat, halogeton, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 5 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
 5 to 14 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.8); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
 14 to 60 inches or more—gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Frequency—frequent; duration—very brief; months—December through May  
*Permeability:* Moderately rapid  
*Available water capacity:* 5.9 to 7.7 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Adjacent nonburied fan piedmont remnants  
*Contrasting features:* Layer of clay accumulation  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### Inclusion 2

*Position on landscape:* Adjacent inset fans  
*Contrasting features:* Very gravelly substratum  
*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

### Wildlife habitat elements:

*Suitability of the Creemon soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Broyles soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### Ratings of the Creemon Soil for Selected Uses

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping, excess salt

**Ratings of the Orovada Soil for Selected Uses***Range seeding:* Fair—too arid*Daily cover for landfill:* Good*Shallow excavations:* Slight*Local roads and streets:* Moderate—frost action*Roadfill:* Good*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Fair—small stones*Pond reservoir areas:* Moderate—seepage, slope*Embankments, dikes, and levees:* Severe—piping**Ratings of the Broyles Soil for Selected Uses***Range seeding:* Poor—too arid, excess salt*Daily cover for landfill:* Fair—small stones*Shallow excavations:* Moderate—flooding*Local roads and streets:* Severe—flooding*Roadfill:* Good*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Fair—small stones, thin layer*Pond reservoir areas:* Moderate—seepage, slope*Embankments, dikes, and levees:* Severe—piping**Interpretive Groups***Capability classification:* Cremon soil—IIw, irrigated, and VIIw, nonirrigated; Orovada soil—Ile, irrigated, and VIc, nonirrigated; Broyles soil—IIw, irrigated, and VIIw, nonirrigated*Range site:* Cremon soil—024X014N; Orovada soil—024X020N; Broyles soil—024X014N**295—Cremon-Cren association****Map Unit Setting***Position on landscape:* Fan skirts and inset fans*Elevation:* 4,800 to 5,000 feet*Average annual precipitation:* About 7 inches*Average annual air temperature:* About 48 degrees F*Frost-free season:* About 110 days**Composition***Major components:*

- Cremon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—55 percent
- Cren silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-silty, mixed (calcareous), mesic—30 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Typic Torriorthents, 0 to 2 percent

slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—5 percent

- Inclusion 3: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

**Characteristics of the Cremon Soil***Position on landscape:* Slightly dissected fan skirts*Parent material:* Silty mixed alluvium influenced by volcanic ash*Slope features:* Length—long; shape—smooth*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail**Typical Profile**

0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 45 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—ML; estimated AASHTO classification—A-4

45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

**Soil and Water Features***Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* In the upper 45 inches—moderate; below this depth—moderately rapid*Available water capacity:* 9.7 to 11.6 inches*Water-supplying capacity:* 7 inches*Runoff:* Very slow*Hydrologic group:* B*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5*Hazard of erosion:* By water—slight; by wind—slight*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Cren Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

7 to 26 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

26 to 60 inches or more—stratified fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Active channels on lower part of inset fans

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, black greasewood

#### **Inclusion 2**

*Position on landscape:* Fan drainageways

*Contrasting features:* Strongly salt- and sodium-affected surface layer

*Distinctive present vegetation:* Shadscale, black greasewood

#### **Inclusion 3**

*Position on landscape:* Active channels on higher part of fan skirt and inset fans

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Wyoming big sagebrush, black greasewood, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

#### **Wildlife habitat elements:**

*Suitability of the Cremon soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Cren soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### **Ratings of the Cremon Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

### **Ratings of the Cren Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

### **Interpretive Groups**

*Capability classification:* Cremon soil—IIc, irrigated, and VIIc, nonirrigated; Cren soil—IIc, irrigated, and VIIc, nonirrigated

*Range site:* Cremon soil—024X002N; Cren soil—024X002N

**296—Creemon-Hessing association****Map Unit Setting**

*Position on landscape:* Fan skirts and inset fans

*Elevation:* 4,700 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—65 percent
- Hessing silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Camborthids, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-silty, mixed, mesic—8 percent
- Inclusion 2: Duric Camborthids, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—4 percent
- Inclusion 3: Typic Camborthids, 0 to 4 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—3 percent

**Characteristics of the Creemon Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass

**Typical Profile**

- 0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 10 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 15 to 45 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent

pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 45 inches—moderate; below this depth—moderately rapid

*Available water capacity:* 9.7 to 11.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

**Characteristics of the Hessing Soil**

*Position on landscape:* Inset fans

*Parent material:* Alluvium and loess with some influence of volcanic ash over coarse mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bug sagebrush, Indian ricegrass, bottlebrush squirreltail

**Typical Profile**

- 0 to 4 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 4 to 11 inches—silt loam, silty clay loam; prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 11 to 18 inches—very fine sandy loam, silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 18 to 30 inches—gravelly loam; 35 to 45 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GM; estimated AASHTO classification—A-4
- 30 to 60 inches or more—stratified very gravelly loamy

coarse sand to extremely gravelly sand; 65 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 30 inches—moderate; below this depth—very rapid  
*Available water capacity:* 6.0 to 7.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—3; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Adjacent to channels  
*Contrasting features:* Receives additional soil moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, spiny hopsage

#### Inclusion 2

*Position on landscape:* Lower margins of fan skirts  
*Contrasting features:* Receives additional soil moisture from shallow, low-velocity surface flow  
*Distinctive present vegetation:* Shadscale, bud sagebrush, winterfat

#### Inclusion 3

*Position on landscape:* Upper margins of fan skirts  
*Contrasting features:* Very gravelly throughout the soil profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

### Wildlife habitat elements:

*Suitability of the Cremon soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Hessing soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

### Ratings of the Cremon Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—thin layer  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping

### Ratings of the Hessing Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt  
*Daily cover for landfill:* Poor—seepage, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage, excess salt

### Interpretive Groups

*Capability classification:* Cremon soil—IIC, irrigated, and VIIc, nonirrigated; Hessing soil—IIs, irrigated, and VIIs, nonirrigated  
*Range site:* Cremon soil—024X002N; Hessing soil—024X002N

## 297—Cremon-Orovada-Tulase association

### Map Unit Setting

*Position on landscape:* Fan skirts and inset fans  
*Elevation:* 5,500 to 5,800 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### Composition

#### Major components:

- Cremon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—45 percent
  - Orovada very fine sandy loam, 0 to 2 percent slopes, rarely flooded—Durixerollic Camborthids, coarse-loamy, mixed, mesic—20 percent
  - Tulase very fine sandy loam, 0 to 2 percent slopes—Durorthidic Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic—20 percent
- Contrasting inclusions:*
- Inclusion 1: Batan very fine sandy loam, 0 to 2 percent

slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

• Inclusion 2: Xeric Torriorthents, 0 to 2 percent

slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

• Inclusion 3: Durixerollic Camborthids, 0 to 4 percent

slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

### **Characteristics of the Creemon Soil**

*Position on landscape:* Stable, lower fan skirts

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 45 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 45 inches—moderate; below this depth—moderately rapid

*Available water capacity:* 9.7 to 11.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Orovada Soil**

*Position on landscape:* Inset fans

*Parent material:* Loess influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, downy rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 8.6 to 9.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Tulase Soil**

*Position on landscape:* Upper fan skirts

*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth



**Dominant present vegetation:** Wyoming big sagebrush, bottlebrush squirreltail, bluebunch wheatgrass

### Typical Profile

- 0 to 6 inches—very fine sandy loam; platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 6 to 60 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

### Soil and Water Features

**Depth to seasonal high water table:** More than 60 inches  
**Frequency of flooding:** None  
**Permeability:** Moderate  
**Available water capacity:** 9.0 to 12.4 inches  
**Water-supplying capacity:** 8 inches  
**Runoff:** Very slow  
**Hydrologic group:** B  
**Erosion factors (surface layer):** K value—.43; T value—5; wind erodibility group—3  
**Hazard of erosion:** By water—slight; by wind—slight  
**Shrink-swell potential:** Low  
**Corrosivity:** To steel—high; to concrete—low  
**Potential frost action:** Moderate

### Contrasting Inclusions

#### Inclusion 1

**Position on landscape:** Convex lower margins of fan skirts  
**Contrasting features:** Strongly salt- and sodium-affected surface layer  
**Distinctive present vegetation:** Shadscale, black greasewood

#### Inclusion 2

**Position on landscape:** Adjacent to stream channels  
**Contrasting features:** Receives additional soil moisture from runoff  
**Distinctive present vegetation:** Basin big sagebrush, black greasewood

#### Inclusion 3

**Position on landscape:** Adjacent convex beach terrace remnants  
**Contrasting features:** Very gravelly throughout the soil profile  
**Distinctive present vegetation:** Wyoming big sagebrush, spiny hopsage

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

### Wildlife habitat elements:

**Suitability of the Creemon soil for named elements:** Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Suitability of the Orovada soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Suitability of the Tulse soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Creemon Soil for Selected Uses

**Range seeding:** Poor—too arid, excess salt  
**Daily cover for landfill:** Good  
**Shallow excavations:** Slight  
**Local roads and streets:** Slight  
**Roadfill:** Good  
**Sand:** Improbable source—excess fines  
**Gravel:** Improbable source—excess fines  
**Topsoil:** Poor—thin layer  
**Pond reservoir areas:** Moderate—seepage  
**Embankments, dikes, and levees:** Severe—piping

### Ratings of the Orovada Soil for Selected Uses

**Range seeding:** Fair—too arid  
**Daily cover for landfill:** Good  
**Shallow excavations:** Slight  
**Local roads and streets:** Moderate—frost action, flooding  
**Roadfill:** Good  
**Sand:** Improbable source—excess fines  
**Gravel:** Improbable source—excess fines  
**Topsoil:** Fair—small stones, thin layer  
**Pond reservoir areas:** Moderate—seepage  
**Embankments, dikes, and levees:** Severe—piping

### Ratings of the Tulse Soil for Selected Uses

**Range seeding:** Fair—too arid  
**Daily cover for landfill:** Good  
**Shallow excavations:** Slight  
**Local roads and streets:** Moderate—frost action  
**Roadfill:** Good  
**Sand:** Improbable source—excess fines  
**Gravel:** Improbable source—excess fines  
**Topsoil:** Good  
**Pond reservoir areas:** Moderate—seepage  
**Embankments, dikes, and levees:** Severe—piping

### Interpretive Groups

**Capability classification:** Creemon soil—IIc, irrigated, and VIIc, nonirrigated; Orovada soil—IIc, irrigated, and VIc, nonirrigated; Tulse soil—IIc, irrigated, and VIc, nonirrigated

*Range site:* Creemon soil—024X002N; Orovada soil—024X005N; Tulase soil—024X005N

## 298—Creemon-Misad association

### **Map Unit Setting**

*Position on landscape:* Basin floor and beach terraces

*Elevation:* 5,000 to 5,100 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—60 percent

- Misad gravelly sandy loam, 2 to 4 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Duric Camborthids, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—6 percent

- Inclusion 2: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 3: Durixerollic Camborthids, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—2 percent

- Inclusion 4: Durorthidic Xeric Torriorthents, 0 to 2 percent slopes—Durorthidic Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic—2 percent

### **Characteristics of the Creemon Soil**

*Position on landscape:* Beach terrace

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR 2 to 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 45 inches—stratified very fine sandy loam to silt

loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—ML; estimated AASHTO classification—A-4

45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 45 inches—moderate; below this depth—moderately rapid

*Available water capacity:* 9.7 to 11.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Misad Soil**

*Position on landscape:* Offshore bars

*Parent material:* Gravelly stratified lacustrine sediments influenced by volcanic ash

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-1, A-2

7 to 31 inches—stratified fine sandy loam to very gravelly sandy loam; 5 to 10 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

31 to 60 inches or more—very gravelly loamy sand to

extremely gravelly coarse sand; 5 to 10 percent cobbles and stones and 60 to 80 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 31 inches—moderately rapid; below this depth—rapid  
*Available water capacity:* 2.9 to 4.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Alluvial flat remnants between bars  
*Contrasting features:* Fine sandy loam throughout the soil profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### Inclusion 2

*Position on landscape:* Alluvial flats along lower part of unit  
*Contrasting features:* Silty clay loam subsoil, moderately well drained  
*Distinctive present vegetation:* Shadscale, bud sagebrush, black greasewood

#### Inclusion 3

*Position on landscape:* Concave, narrow inset fans dissecting offshore bars  
*Contrasting features:* Receives additional soil moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### Inclusion 4

*Position on landscape:* Fan skirt margins on upper part of unit  
*Contrasting features:* Receives additional soil moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

#### Wildlife habitat elements:

*Suitability of the Creemon soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Misad soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Creemon Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—thin layer  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping

#### Ratings of the Misad Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt  
*Daily cover for landfill:* Poor—seepage, small stones, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Creemon soil—IIc, irrigated, and VIIc, nonirrigated; Misad soil—IIIe, irrigated, and VIIs, nonirrigated

*Range site:* Creemon soil—024X002N; Misad soil—024X002N

### 300—Cren silt loam

#### Map Unit Setting

*Position on landscape:* Fan skirts  
*Elevation:* 4,800 to 5,100 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Cren silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-silty, mixed (calcareous), mesic—85 percent

#### *Contrasting inclusions:*

- Inclusion 1: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—6 percent
- Inclusion 2: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—3 percent
- Inclusion 3: Hessian silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—3 percent
- Inclusion 4: Pumper silt loam, 0 to 2 percent slopes—Typic Camborthids, sandy-skeletal, mixed, mesic—3 percent

### **Characteristics of the Cren Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

7 to 26 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

26 to 60 inches or more—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent lower inset fans

*Contrasting features:* Noncalcareous subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth upper margins of fan skirts

*Contrasting features:* Coarser textured throughout the soil profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Adjacent, smooth, upper inset fans

*Contrasting features:* Gravelly substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 4**

*Position on landscape:* Areas adjacent to stream channels

*Contrasting features:* Very gravelly throughout the soil profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features of the Cren Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—thin layer  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated  
*Range site:* 024X002N

## **303—Cren-Doowak-Relley association**

### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,400 to 5,600 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Cren silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-silty, mixed (calcareous), mesic—40 percent
  - Doowak very gravelly loamy sand, 0 to 2 percent slopes—Xeric Torriorthents, sandy-skeletal, mixed, mesic—25 percent
  - Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—20 percent
- Contrasting inclusions:*
- Inclusion 1: Raglan silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—6 percent
  - Inclusion 2: Xeric Torriorthents 0 to 2 percent slopes, frequently flooded—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
  - Inclusion 3: Xeric Torriorthents 0 to 2 percent slopes, frequently flooded—Xeric Torriorthents, sandy-skeletal, mixed, mesic—4 percent

### **Characteristics of the Cren Soil**

*Position on landscape:* Upper part of fan skirts  
*Parent material:* Mixed alluvium influenced by volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush

### **Typical Profile**

0 to 7 inches—silt loam; platy structure; slightly hard,

very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

7 to 26 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

26 to 60 inches or more—stratified fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Doowak Soil**

*Position on landscape:* Adjacent inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage

### **Typical Profile**

0 to 6 inches—very gravelly loamy sand; 5 to 10 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

6 to 60 inches or more—stratified extremely gravelly sand to extremely gravelly loamy sand; 5 to 10 percent cobbles and stones and 75 to 90 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Very rapid  
*Available water capacity:* 1.9 to 3.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

**Characteristics of the Relley Soil**

*Position on landscape:* Lower part of fan skirts  
*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush

**Typical Profile**

0 to 8 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4  
 8 to 16 inches—silt loam; 0 to 5 percent pebbles (by weight); prismatic structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4  
 16 to 28 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4  
 28 to 60 inches or more—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 20 to 30); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 10.8 to 12.0 inches  
*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Lower margin of fan skirt

*Contrasting features:* Loam substrata

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 2**

*Position on landscape:* Concave stringers adjacent to channels

*Contrasting features:* Receives additional moisture from runoff and flooding

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

**Inclusion 3**

*Position on landscape:* Areas adjacent to deep channels

*Contrasting features:* Receives additional moisture from runoff and flooding

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Cren soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Doowak soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Relley soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Cren Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

**Ratings of the Doowak Soil for Selected Uses**

*Range seeding:* Poor—too sandy, droughty, small stones

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, too sandy

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Relley Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Fair—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

**Interpretive Groups**

*Capability classification:* Cren soil—IIc, irrigated, and VIIc, nonirrigated; Doowak soil—VIIc, nonirrigated; Relley soil—IIc, irrigated, and VIIc, nonirrigated

*Range site:* Cren soil—024X002N; Doowak soil—024X020N; Relley soil—024X002N

**304—Cren-Raglan-Batan association****Map Unit Setting**

*Position on landscape:* Fan skirts and alluvial flats

*Elevation:* 4,700 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Cren silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-silty, mixed (calcareous), mesic—60 percent
- Raglan silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—20 percent
- Batan silt loam, 0 to 2 percent slopes—Durorthidic

Torriorthents, fine-silty, mixed (calcareous), mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Camborthids, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—5 percent

**Characteristics of the Cren Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush

**Typical Profile**

0 to 7 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

7 to 26 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

26 to 60 inches or more—stratified fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

**Characteristics of the Raglan Soil**

*Position on landscape:* Higher parts of alluvial flat remnants

*Parent material:* A loess mantle high in volcanic ash over mixed alluvium

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Bud sagebrush, shadscale

### Typical Profile

- 0 to 6 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
- 6 to 14 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6
- 14 to 60 inches or more—stratified very fine sandy loam to silty clay loam; 0 to 15 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 9.6 to 11.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Characteristics of the Batan Soil

*Position on landscape:* Lower parts of alluvial flat remnants  
*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Black greasewood, shadscale, bud sagebrush

### Typical Profile

- 0 to 5 inches—silt loam; platy structure; hard, very friable; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
- 5 to 68 inches or more—stratified silt loam to silty clay

loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 11.3 to 12.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave areas adjacent to channels  
*Contrasting features:* Sandy loam substratum  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Cren soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Raglan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Batan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Cren Soil for Selected Uses

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—thin layer  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt



**Ratings of the Raglan Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Fair—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, excess salt

**Ratings of the Batan Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

**Interpretive Groups**

*Capability classification:* Cren soil—IIc, irrigated, and VIIc, nonirrigated; Raglan soil—IIc, irrigated, and VIIc, nonirrigated; Batan soil—IIIs, irrigated, and VIIs, nonirrigated

*Range site:* Cren soil—024X002N; Raglan soil—024X002N; Batan soil—024X003N

**310—Davey fine sandy loam****Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,600 to 5,600 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Davey fine sandy loam, 0 to 2 percent slopes—Xerollic Camborthids, sandy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Goldrun fine sand, 0 to 4 percent slopes—Xeric Torripsamments, mixed, mesic—10 percent
- Inclusion 2: Orovada fine sandy loam, 0 to 2 percent

slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent

**Characteristics of the Davey Soil**

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Basin big sagebrush, spiny hopsage, needleandthread, Indian ricegrass, bottlebrush squirreltail

**Typical Profile**

0 to 5 inches—fine sandy loam; platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

5 to 20 inches—fine sandy loam; subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

20 to 60 inches or more—loamy fine sand, fine sand; 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 20 inches—moderately rapid; below this depth—rapid

*Available water capacity:* 4.4 to 5.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Rounded and undulating dunes overplacing fan skirts

*Contrasting features:* Sandy throughout the soil profile

*Distinctive present vegetation:* Indian ricegrass, basin big sagebrush

**Inclusion 2**

*Position on landscape:* Smooth fan skirt remnants

*Contrasting features:* Loamy throughout the soil

*Distinctive present vegetation:* Wyoming big sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—soil blowing

*Daily cover for landfill:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, piping

*Drainage:* Deep to water

*Irrigation:* Droughty, soil blowing

*Terraces and diversions:* Too sandy, soil blowing

**Interpretive Groups**

*Capability classification:* IIIs, irrigated, and VIc, nonirrigated

*Range site:* 024X017N

**312—Davey fine sandy loam, cemented substratum****Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 4,800 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

• Davey fine sandy loam, cemented substratum, 0 to 2 percent slopes—Xerollic Camborthids, sandy, mixed, mesic—85 percent

**Contrasting inclusions:**

• Inclusion 1: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent

• Inclusion 2: Goldrun fine sand, 0 to 4 percent slopes—Xeric Torripsamments, mixed, mesic—5 percent

• Inclusion 3: Orovada fine sandy loam, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent

**Characteristics of the Davey Soil**

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Big sagebrush, spiny hopsage, kochia

**Typical Profile**

0 to 20 inches—fine sandy loam; prismatic structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

20 to 50 inches—loamy fine sand; 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-2

50 to 60 inches—strongly cemented duripan

**Soil and Water Features**

*Depth to hardpan:* 50 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the hardpan—rapid

*Available water capacity:* 4.4 to 5.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—3; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Lower fan skirt margins

*Contrasting features:* Silty subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 2**

*Position on landscape:* Dunes overplacing fan skirts

*Contrasting features:* Sandy throughout the soil profile

*Distinctive present vegetation:* Basin big sagebrush

**Inclusion 3**

*Position on landscape:* Adjacent inset fans

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops

(irrigated)—fair; domestic grasses and legumes

(irrigated)—fair; wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair;

wetland plants—very poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—soil blowing

*Daily cover for landfill:* Fair—too sandy, cemented pan, thin layer

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Fair—thin layer

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer, small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Soil blowing, excess salt

*Terraces and diversions:* Soil blowing

**Interpretive Groups**

*Capability classification:* IIIs, irrigated, and VIc, nonirrigated

*Range site:* 024X017N

**313—Davey-Goldrun complex****Map Unit Setting**

*Position on landscape:* Sand sheets

*Elevation:* 4,800 to 5,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition***Major components:*

• Davey fine sandy loam, 0 to 2 percent slopes—Xerollic Camborthids, sandy, mixed, mesic—65 percent

• Goldrun fine sand, 0 to 4 percent slopes—Xeric Torripsamments, mixed, mesic—25 percent

*Contrasting inclusions:*

• Inclusion 1: Orovada very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—10 percent

**Characteristics of the Davey Soil**

*Position on landscape:* Sand sheets

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, spiny hopsage, bottlebrush squirreltail, cheatgrass, Wyoming big sagebrush

**Typical Profile**

0 to 5 inches—fine sandy loam; platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

5 to 20 inches—fine sandy loam; subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

20 to 60 inches or more—loamy fine sand, fine sand; 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 20 inches—moderately rapid; below this depth—rapid

*Available water capacity:* 4.4 to 5.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Goldrun Soil**

*Position on landscape:* Dunes

*Parent material:* Sandy eolian materials influenced by volcanic ash

*Slope features:* Length—short; shape—undulating

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Indian ricegrass, spiny hopsage

#### **Typical Profile**

0 to 7 inches—fine sand; massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

7 to 60 inches or more—fine sand; massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* 4.2 to 5.4 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave inset fans dissecting sand sheets

*Contrasting features:* Loamy subsoil

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability of the Davey soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

*Suitability of the Goldrun soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

### **Ratings and Restrictive Features of the Davey Soil for Selected Uses and Practices**

*Range seeding:* Poor—soil blowing

*Daily cover for landfill:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, piping

*Drainage:* Deep to water

*Irrigation:* Droughty, soil blowing

*Terraces and diversions:* Too sandy, soil blowing

### **Ratings and Restrictive Features of the Goldrun Soil for Selected Uses and Practices**

*Range seeding:* Poor—soil blowing, too sandy

*Daily cover for landfill:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—too sandy

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, seepage

*Drainage:* Deep to water

*Irrigation:* Droughty, fast intake, soil blowing

*Terraces and diversions:* Too sandy, soil blowing

### **Interpretive Groups**

*Capability classification:* Davey soil—IIIs, irrigated, and VIc, nonirrigated; Goldrun soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Davey soil—024X017N; Goldrun soil—024X001N

## **340—Duffer very fine sandy loam**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,500 to 4,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Duffer very fine sandy loam, 0 to 2 percent slopes—Aquic Calciorthids, fine-silty, carbonatic, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Sombrero very fine sandy loam, 0 to 2 percent slopes—Aquentic Durorthids, loamy, mixed, mesic, shallow—6 percent
- Inclusion 2: Reese silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—3 percent
- Inclusion 3: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 4: Sonoma silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—3 percent

### **Characteristics of the Duffer Soil**

*Position on landscape:* Flood plain remnants

*Parent material:* Mixed alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Rubber rabbitbrush, alkali sacaton, inland saltgrass, iodinebush

### **Typical Profile**

- 0 to 4 inches—very fine sandy loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); strongly saline (30 to 40 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
- 4 to 29 inches—silt loam, silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
- 29 to 60 inches or more—stratified very fine sandy loam to silty clay loam; massive; slightly hard and hard, friable and firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* February through June—18 to 36 inches; rest of year—below 36 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 10.0 to 12.4 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Irregularly shaped areas on adjacent stream terraces

*Contrasting features:* Strongly cemented duripan within a depth of 20 inches

*Distinctive present vegetation:* Black greasewood, basin wildrye, inland saltgrass

#### **Inclusion 2**

*Position on landscape:* Outer margins of flood plains

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Black greasewood, basin wildrye, inland saltgrass

#### **Inclusion 3**

*Position on landscape:* Adjacent alluvial flat remnants

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Black greasewood, shadscale

#### **Inclusion 4**

*Position on landscape:* Lower flood plains

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Basin wildrye, creeping wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Fair—wetness

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Fair—low strength, wetness, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—wetness, excess salt

*Drainage:* Frost action, excess salt

*Irrigation:* Wetness, soil blowing, erodes easily

*Terraces and diversions:* Erodes easily, wetness, soil blowing

### ***Interpretive Groups***

*Capability classification:* VIw, irrigated; VIIw, nonirrigated

*Range site:* 024X010N

## **370—Enko fine sandy loam, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Position on landscape:* Fan skirts

*Elevation:* 4,700 to 5,200 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 8 degrees F

*Frost-free season:* About 110 days

### ***Composition***

*Major components:*

- Enko fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Goldrun fine sand—Xeric Torripsamments, mixed, mesic—10 percent

### ***Characteristics of the Enko Soil***

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### ***Typical Profile***

0 to 7 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

7 to 15 inches—loam, sandy loam, fine sandy loam; 0 to 15 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

15 to 60 inches or more—sandy loam, loam, fine sandy loam; 0 to 25 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-2, A-4

### ***Soil and Water Features***

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.4 to 8.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### ***Contrasting Inclusions***

#### ***Inclusion 1***

*Position on landscape:* Sand sheets overplacing fan skirts

*Contrasting features:* Sandy throughout the soil profile

*Distinctive present vegetation:* Basin big sagebrush, Indian ricegrass

### ***Major Uses***

**Current uses:** Rangeland, wildlife habitat

#### ***Wildlife habitat elements:***

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### ***Ratings for Selected Uses***

*Range seeding:* Fair—too arid, excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* IVE, irrigated, and VIs,  
 nonirrigated

*Range site:* Enko soil—024X005N

## **371—Enko-Shabliss-Orovada association**

### **Map Unit Setting**

*Position on landscape:* Piedmonts slopes

*Elevation:* 4,800 to 5,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Enko fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—60 percent
- Shabliss very fine sandy loam, 15 to 30 percent slopes—Haploxerollic Durorthids, loamy, mixed, mesic, shallow—15 percent
- Orovada very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torripsamments, 8 to 15 percent slopes—Xeric Torripsamments, mixed, mesic—10 percent

### **Characteristics of the Enko Soil**

*Position on landscape:* Fan aprons overlaping fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass

### **Typical Profile**

0 to 7 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

7 to 15 inches—loam, sandy loam, fine sandy loam; 0 to 15 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4

mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

15 to 60 inches or more—sandy loam, loam, fine sandy loam; 0 to 25 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-2, A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.4 to 8.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Shabliss Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass

### **Typical Profile**

0 to 6 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 16 inches—very fine sandy loam, loam, silt loam; 0 to 5 percent cobbles and stones and 0 to 5 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

16 to 34 inches—strongly cemented duripan; platy structure; very hard, very firm

34 to 60 inches or more—loamy sand, gravelly loamy sand; 0 to 5 percent cobbles and stones and 20 to

40 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 12 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.7 to 3.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Orovida Soil

*Position on landscape:* Fan skirts  
*Parent material:* Loess capped mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Sandberg bluegrass

### Typical Profile

0 to 8 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); prismatic structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
 20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Sand sheets and sand dunes overplacing fan skirts  
*Contrasting features:* Sandy throughout the soil profile  
*Distinctive present vegetation:* Indian ricegrass, basin big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Enko soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Shabliss soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Orovida soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Enko Soil for Selected Uses

*Range seeding:* Fair—too arid, excess salt  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—frost action  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—poor—excess salt  
*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping

#### Ratings of the Shabliss Soil for Selected Uses

*Range seeding:* Fair—too arid, cemented pan  
*Daily cover for landfill:* Poor—cemented pan, slope  
*Shallow excavations:* Severe—cemented pan, cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—cemented pan, slope



*Pond reservoir areas:* Severe—seepage, cemented pan, slope

*Embankments, dikes, and levees:* Severe—piping, seepage

#### **Ratings of the Orovada Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, thin layer

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

#### **Interpretive Groups**

*Capability classification:* Enko soil—IVe, irrigated, and VIs, nonirrigated; Shabliss soil—VIIe, nonirrigated; Orovada soil—IIIe, irrigated, and VIc, nonirrigated

*Range site:* Enko soil—024X005N; Shabliss soil—024X005N; Orovada soil—024X020N

### **400—Glean-Walti-Cleavage association**

#### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,600 to 8,000 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 60 days

#### **Composition**

##### **Major components:**

- Glean gravelly loam, 30 to 50 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—40 percent
- Walti gravelly loam, 15 to 30 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—25 percent
- Cleavage extremely gravelly loam, 15 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—20 percent

##### **Contrasting inclusions:**

- Inclusion 1: Aridic Argixerolls, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—6 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Rubble land—2 percent
- Inclusion 4: Pachic Haploxerolls, 15 to 50 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent

#### **Characteristics of the Glean Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Mixed colluvium and residuum

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, rubber rabbitbrush, arrowleaf balsamroot, bluebunch wheatgrass

*Surface cover:* 20 percent pebbles, 1 percent cobbles

#### **Typical Profile**

0 to 6 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

6 to 49 inches—very gravelly loam, very gravelly sandy loam; 0 to 25 percent cobbles and stones and 40 to 75 percent pebbles (by weight); massive; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

49 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.1 to 5.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—3; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Walti Soil**

*Position on landscape:* Shoulders and upper side slopes of mountains at higher elevations

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, Idaho fescue, bluebunch wheatgrass

#### **Typical Profile**

0 to 4 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm);

nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC, CL-ML; estimated AASHTO classification—A-4

4 to 10 inches—gravelly clay loam, clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

10 to 30 inches—clay, gravelly clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); prismatic structure; very hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7

30 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.7 to 4.8 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

#### **Characteristics of the Cleavage Soil**

*Position on landscape:* Crests of mountains

*Parent material:* Kind—gravelly residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, black sagebrush, Sandberg bluegrass, Idaho fescue

#### **Typical Profile**

0 to 4 inches—extremely gravelly loam; 0 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 0 to 45

percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Convex back slopes of mountains

*Contrasting features:* Loamy soils with bedrock at a depth of 20 to 40 inches

*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue, bluebunch wheatgrass

##### **Inclusion 2**

*Position on landscape:* Rimrock on shoulder slopes of mountains and scattered peaks

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* Barren

##### **Inclusion 3**

*Position on landscape:* Side slopes of mountains below rock outcrop

*Contrasting features:* More than 90 percent stones on the soil surface

*Distinctive present vegetation:* Barren

##### **Inclusion 4**

*Position on landscape:* Concave snow pockets on side slopes of mountains below shoulders

*Contrasting features:* Receives additional soil moisture from drifted snow

*Distinctive present vegetation:* Snowberry, mountain big sagebrush, currant, mountain brome

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Glean soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Suitability of the Walti soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Glean Soil for Selected Uses**

*Range seeding:* Fair—droughty, small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope, seepage

*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Walti Soil for Selected Uses**

*Range seeding:* Fair—erodes easily, rooting depth

*Daily cover for landfill:* Poor—depth to bedrock, too clayey, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, slope, shrink-swell

*Roadfill:* Poor—depth to bedrock, low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer, hard to pack

**Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

**Interpretive Groups**

*Capability classification:* Glean soil—VIIe, nonirrigated;

Walti soil—VIIe, nonirrigated; Cleavage soil—VIIs, nonirrigated

*Range site:* Glean soil—024X023N; Walti soil—024X027N; Cleavage soil—024X016N

**411—Golconda-Blackhawk association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,500 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Golconda very fine sandy loam, 2 to 8 percent slopes, stony—Haplic Nadurargids, fine-loamy, mixed, mesic—50 percent

- Blackhawk very fine sandy loam, 0 to 4 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—35 percent

*Contrasting inclusions:*

- Inclusion 1: Misad very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—10 percent

- Inclusion 2: Durixerollic Camborthids, 2 to 4 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

**Characteristics of the Golconda Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud

sagebrush, spiny hopsage, bottlebrush squirreltail

*Rock fragments on the surface:* Kind—stones; percentage of surface covered—1 percent

**Typical Profile**

0 to 8 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 27 inches—clay loam, gravelly clay loam; 10 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); strongly saline (16 to 25 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, GC;

estimated AASHTO classification—A-6, A-7  
 27 to 43 inches—strongly cemented duripan; massive; extremely hard, extremely firm  
 43 to 60 inches or more—very gravelly loamy coarse sand, very gravelly sandy loam; 50 to 75 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM, GM, GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 4.2 to 5.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Characteristics of the Blackhawk Soil

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Loamy mixed alluvium influenced by loess  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, spiny hopsage, bottlebrush squirreltail

### Typical Profile

0 to 8 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 8 to 14 inches—loam, very fine sandy loam, silt loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 14 to 17 inches—strongly cemented hardpan; massive; very hard, very firm  
 17 to 38 inches—stratified sandy loam to extremely gravelly loamy coarse sand; 10 to 30 percent pebbles (by weight); massive; slightly hard, friable;

very strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

38 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 50 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—GP-GM, GP, SP-SM, SP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the hardpan—moderate; below the hardpan—very rapid  
*Available water capacity:* 2.2 to 2.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.43; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Inset fan remnants  
*Contrasting features:* Very deep soil  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Inset fans  
*Contrasting features:* Very deep soil that receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Golconda soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Blackhawk soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### Ratings of the Golconda Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, seepage

#### **Ratings of the Blackhawk Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan

*Pond reservoir areas:* Severe—seepage, cemented pan

*Embankments, dikes, and levees:* Severe—seepage, excess salt

#### **Interpretive Groups**

*Capability classification:* Golconda soil—IVe, irrigated, and VIIs, nonirrigated; Blackhawk soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Golconda soil—024X002N; Blackhawk soil—024X002N

### **412—Golconda-Dun Glen association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Golconda gravelly very fine sandy loam, 4 to 8 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—65 percent

- Dun Glen very fine sandy loam, 2 to 4 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Haplic Nadurargids, 4 to 8 percent

slopes—Haplic Nadurargids, loamy, mixed, mesic, shallow—9 percent

- Inclusion 2: Typic Torriorthents, 2 to 4 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—4 percent

- Inclusion 3: Xerollic Camborthids, 2 to 4 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—2 percent

#### **Characteristics of the Golconda Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Loess influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 10 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 35 to 45 percent pebbles (by weight); loam; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

10 to 23 inches—clay loam, gravelly clay loam, silty clay loam; 10 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

23 to 36 inches—strongly cemented duripan; massive; extremely hard, extremely firm

36 to 60 inches—very gravelly loamy coarse sand, very gravelly sandy loam; 50 to 75 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 4.2 to 5.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Characteristics of the Dun Glen Soil**

*Position on landscape:* Broad inset fans  
*Parent material:* Loamy mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 3 to 10 inches—very fine sandy loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 10 to 60 inches or more—fine sandy loam, very fine sandy loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* 6.8 to 8.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex summits and shoulder slopes of fan piedmont remnants

*Contrasting features:* Duripan within a depth of 20 inches

*Distinctive present vegetation:* Downy rabbitbrush, shadscale

#### **Inclusion 2**

*Position on landscape:* Adjacent convex fan skirts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Bud sagebrush, shadscale

#### **Inclusion 3**

*Position on landscape:* Concave inset fans adjacent to channels

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

#### **Wildlife habitat elements:**

*Suitability of the Golconda soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Dun Glen soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Golconda Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—cemented pan, small stones, seepage

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—low strength

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

#### **Ratings of the Dun Glen Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones

*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Golconda soil—IVe, irrigated, and VIIs, nonirrigated; Dun Glen soil—Ile, irrigated, and VIIc, nonirrigated

*Range site:* Golconda soil—024X002N; Dun Glen soil—024X002N

## **413—Golconda-Blownout land complex**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Golconda gravelly very fine sandy loam, 2 to 8 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—60 percent

- Blownout land—25 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—9 percent

- Inclusion 2: Typic Torriorthents, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

- Inclusion 3: Minat very cobbly loam, 15 to 50 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—1 percent

### **Characteristics of the Golconda Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush

### **Typical Profile**

0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and 35 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GC; estimated AASHTO classification—A-4

8 to 27 inches—clay loam, gravelly clay loam; 10 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); strongly saline

(16 to 25 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7

27 to 43 inches—strongly cemented duripan; massive; extremely hard, extremely firm

43 to 60 inches or more—extremely gravelly loamy coarse sand, very gravelly sandy loam; 50 to 85 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 36); estimated Unified classification—GP-GM, GM, GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 4.2 to 5.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of Blownout Land**

*Position on landscape:* Eroded depressional areas covered with a surface pavement of pebbles

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans on upper part of fan piedmont remnants

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Inset fans on lower part of fan piedmont remnants

*Contrasting features:* Very deep soils that have a very gravelly substratum

*Distinctive present vegetation:* Shadscale

#### **Inclusion 3**

*Position on landscape:* Side slopes of fan piedmont remnants near areas of deeply incised inset fans

*Contrasting features:* Slopes of 15 to 50 percent

*Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Golconda soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings of the Golconda Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, seepage, excess sodium

### Interpretive Groups

*Capability classification:* Golconda soil—Ive, irrigated, and VIIs, nonirrigated; Blownout land—VIIIs

*Range site:* Golconda soil—024X002N

## 420—Goldrun fine sand, 0 to 4 percent slopes

### Map Unit Setting

*Position on landscape:* Sand sheets on fan skirts

*Elevation:* 4,400 to 4,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Goldrun fine sand, 0 to 4 percent slopes—Xeric Torripsamments, mixed, mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Davey fine sandy loam, 0 to 2 percent slopes—Xerollic Camborthids, sandy, mixed, mesic—5 percent
- Inclusion 2: Broyles very fine sandy loam, 2 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—3 percent
- Inclusion 3: Orovada fine sandy loam, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—2 percent

### Characteristics of the Goldrun Soil

*Position on landscape:* Sand sheets on fan skirts

*Parent material:* Eolian material influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Indian ricegrass, basin big sagebrush

### Typical Profile

0 to 7 inches—fine sand; massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

7 to 60 inches or more—fine sand; massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* 4.2 to 5.4 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Nonburied fan skirts on the upper part of the unit

*Contrasting features:* High water-supplying capacity

*Distinctive present vegetation:* Big sagebrush, needleandthread

#### Inclusion 2

*Position on landscape:* Nonburied fan skirts on the lower part of the unit

*Contrasting features:* Slightly salt- and sodium-affected substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Adjacent inset fans

*Contrasting features:* Loamy substratum



*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—soil blowing, too sandy

*Daily cover for landfill:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—too sandy

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, seepage

*Drainage:* Deep to water

*Irrigation:* Droughty, fast intake, soil blowing

*Terraces and diversions:* Too sandy, soil blowing

### **Interpretive Groups**

*Capability classification:* IVs, irrigated, and VIIs, nonirrigated

*Range site:* 024X001N

## **422—Goldrun-Old Camp association**

### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 4,800 to 5,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Goldrun loamy sand, 15 to 30 percent slopes—Xeric Torripsamments, mixed, mesic—50 percent
- Old Camp very cobbly loam, 4 to 8 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—35 percent

#### **Contrasting inclusions:**

- Inclusion 1: Rock outcrop—10 percent

- Inclusion 2: Orovida fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent

### **Characteristics of the Goldrun Soil**

*Position on landscape:* Sand sheets adjacent to and overlaping parts of foothills

*Parent material:* Eolian sands

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Rubber rabbitbrush, cheatgrass

### **Typical Profile**

0 to 7 inches—loamy sand; massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

7 to 60 inches or more—fine sand; massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* 4.2 to 5.4 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Old Camp Soil**

*Position on landscape:* Crests and side slopes of foothills

*Parent material:* Kind—residuum influenced by volcanic ash; source—basalt

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, cheatgrass

### **Typical Profile**

0 to 2 inches—very cobbly loam; 25 to 55 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—GM, SM, GM-GC, SM-SC;  
 estimated AASHTO classification—A-4, A-2  
 2 to 14 inches—very stony clay loam, very cobbly clay  
 loam, extremely stony clay loam; 35 to 50 percent  
 cobbles and stones and 50 to 65 percent pebbles  
 (by weight); angular blocky structure; slightly hard,  
 friable; mildly alkaline (pH 7.8); nonsaline (less than  
 2 mmhos/cm); nonsodic (SAR less than 2);  
 estimated Unified classification—GC; estimated  
 AASHTO classification—A-2, A-6  
 14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.5 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—  
 1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Rimrock and scattered peaks of  
 foothills

*Contrasting features:* Bedrock exposed at the soil  
 surface

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Inset fans

*Contrasting features:* Very deep soil that is sandy loam  
 throughout the soil profile

*Distinctive present vegetation:* Wyoming big sagebrush,  
 spiny hopsage

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Goldrun soil for named elements:* Wild  
 herbaceous plants (nonirrigated)—fair; shrubs  
 (nonirrigated)—fair

*Suitability of the Old Camp soil for named elements:* Wild  
 herbaceous plants (nonirrigated)—fair; shrubs  
 (nonirrigated)—fair

### Ratings of the Goldrun Soil for Selected Uses

*Range seeding:* Poor—soil blowing, too sandy, erodes  
 easily

*Daily cover for landfill:* Poor—too sandy, slope  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—too sandy, slope  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping,  
 seepage

### Ratings of the Old Camp Soil for Selected Uses

*Range seeding:* Poor—droughty, large stones  
*Daily cover for landfill:* Poor—depth to bedrock, small  
 stones  
*Shallow excavations:* Severe—depth to bedrock, large  
 stones  
*Local roads and streets:* Severe—depth to bedrock,  
 large stones  
*Roadfill:* Poor—depth to bedrock, large stones  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones  
*Pond reservoir areas:* Severe—depth to bedrock  
*Embankments, dikes, and levees:* Severe—large stones

### Interpretive Groups

*Capability classification:* Goldrun soil—IVs, irrigated, and  
 VIIs, nonirrigated; Old Camp soil—VIIs, nonirrigated  
*Range site:* Goldrun soil—024X001N; Old Camp soil—  
 024X005N

## 441—Gund-Umberland association

### Map Unit Setting

*Position on landscape:* Lake plains  
*Elevation:* 5,600 to 5,700 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### Composition

#### Major components:

- Gund silt loam, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty over clayey, mixed, nonacid, mesic—50 percent
- Umberland silt loam, 0 to 2 percent slopes, nonflooded—Aeric Halaquepts, fine, montmorillonitic (calcareous), mesic—35 percent

#### Contrasting inclusions:

- Inclusion 1: Aquic Durorthidic Torriorthents, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—8 percent
- Inclusion 2: Aeric Halaquepts, 0 to 2 percent slopes—

Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—4 percent

- Inclusion 3: Playas—3 percent

### **Characteristics of the Gund Soil**

*Position on landscape:* Higher part of lake plain terraces

*Parent material:* Silty alluvium with a component of loess over lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Basin big sagebrush, black greasewood, basin wildrye, rubber rabbitbrush

### **Typical Profile**

0 to 4 inches—silt loam; platy structure; soft, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

4 to 23 inches—silt loam; platy structure; hard, firm; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

23 to 60 inches or more—silty clay, clay; prismatic structure; hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CH; estimated AASHTO classification—A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through June—36 to 42 inches; rest of year—below 42 inches

*Frequency of flooding:* Rare

*Permeability:* Slow

*Available water capacity:* 8.6 to 10.7 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Characteristics of the Umberland Soil**

*Position on landscape:* Lower part of lake plain terraces

*Parent material:* Silty mixed lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, black greasewood, bottlebrush squirreltail

### **Typical Profile**

0 to 4 inches—silt loam; platy structure; hard, friable; strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

4 to 31 inches—silty clay, silty clay loam, clay; massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

31 to 60 inches or more—silty clay, silty clay loam, clay; massive; slightly hard, friable; strongly alkaline (pH 8.5); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 9.0 to 12.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth, highest part of lake plain terraces

*Contrasting features:* Silt loam throughout

*Distinctive present vegetation:* Black greasewood, shadscale, and bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Slightly concave, lower margins of lake plains

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Black greasewood, basin wildrye, rubber rabbitbrush, inland saltgrass

#### **Inclusion 3**

*Position on landscape:* Dry lake extensions and irregularly shaped sink areas

*Contrasting features:* Ponded

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Gund soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

*Suitability of the Umberland soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Gund Soil for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—too clayey, excess salt, hard to pack

*Shallow excavations:* Moderate—too clayey, wetness

*Local roads and streets:* Severe—low strength, frost action, shrink-swell

*Roadfill:* Poor—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium, too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### Ratings of the Umberland Soil for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—too clayey, hard to pack, excess sodium

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, frost action, shrink-swell

*Roadfill:* Poor—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium, too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Interpretive Groups

*Capability classification:* Gund soil—VIIw, nonirrigated; Umberland soil—VIIs, nonirrigated

*Range site:* Gund soil—024X006N; Umberland soil—024X003N

## 442—Gund-Bubus-Wendane association

### Map Unit Setting

*Position on landscape:* Basin floor

*Elevation:* 5,600 to 5,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Gund silt loam, strongly saline-sodic, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty over clayey, mixed, nonacid, mesic—35 percent

- Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—30 percent

- Wendane silt loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—20 percent

#### Contrasting inclusions:

- Inclusion 1: Aquic Torriorthents, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—7 percent

- Inclusion 2: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—4 percent

- Inclusion 3: Aeric Halaquepts, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—4 percent

### Characteristics of the Gund Soil

*Position on landscape:* Lake plain terraces

*Parent material:* Silty mixed alluvium with a component of loess over lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, bud sagebrush

### Typical Profile

0 to 4 inches—silt loam; platy structure; soft, very friable; strongly alkaline (pH 9.0); strongly saline (75 to 100 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

4 to 23 inches—silt loam; platy structure; hard, firm; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 50 to 80); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

23 to 60 inches or more—silty clay, clay loam; prismatic structure; hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CH; estimated AASHTO classification—A-7

### Soil and Water Features

*Depth to seasonal high water table:* February through January—60 to 72 inches; rest of year—below 72 inches

*Frequency of flooding:* Rare  
*Permeability:* Slow  
*Available water capacity:* 8.6 to 10.7 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* High

### **Characteristics of the Bubus Soil**

*Position on landscape:* Alluvial flat remnants  
*Parent material:* Mixed alluvium high in pyroclastics  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, black greasewood, bottlebrush squirreltail

### **Typical Profile**

0 to 6 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 6 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 9.0 to 10.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Wendane Soil**

*Position on landscape:* Alluvial flats  
*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, basin wildrye, inland saltgrass

### **Typical Profile**

0 to 13 inches—silt loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (30 to 50 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 13 to 27 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 27 to 60 inches or more—stratified silt loam to clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 35); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through July—30 to 48 inches; rest of year—below 48 inches  
*Flooding:* Frequency—frequent; duration—brief or long; months—February through June  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent channeled and smooth inset fans  
*Contrasting features:* Slightly salt and sodium affected  
*Distinctive present vegetation:* Basin big sagebrush, black greasewood

#### **Inclusion 2**

*Position on landscape:* Slightly convex remnant shorelines and offshore bars  
*Contrasting features:* Coarse textured, well drained soil that receives additional moisture from runoff

*Distinctive present vegetation:* Black greasewood, shadscale

### **Inclusion 3**

*Position on landscape:* Lower lake terraces subject to ponding

*Contrasting features:* Seasonal ponding

*Distinctive present vegetation:* Black greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Gund soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

*Suitability of the Bubus soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Wendane soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### **Ratings of the Gund Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—too clayey, excess salt, hard to pack

*Shallow excavations:* Moderate—too clayey, wetness

*Local roads and streets:* Severe—low strength, frost action, shrink-swell

*Roadfill:* Poor—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Ratings of the Bubus Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

### **Ratings of the Wendane Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, wetness

*Local roads and streets:* Severe—flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Interpretive Groups**

*Capability classification:* Gund soil—VIIw, nonirrigated;

Bubus soil—IIs, irrigated, and VIIs, nonirrigated;

Wendane soil—VIIw, nonirrigated

*Range site:* Gund soil—024X008N; Bubus soil—024X003N; Wendane soil—024X007N

## **443—Gund-Batan association**

### **Map Unit Setting**

*Position on landscape:* Basin floor

*Elevation:* 5,600 to 5,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Gund silt loam, strongly saline-sodic, drained, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine silty over clayey, mixed, nonacid, mesic—65 percent
- Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Aeris Halaquepts, 0 to 2 percent slopes—Aeris Halaquepts, fine, montmorillonitic (calcareous), mesic—5 percent
- Inclusion 2: Aeris Halaquepts, 0 to 2 percent slopes—Aeris Halaquepts, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 3: Aeris Halaquepts, 0 to 2 percent slopes—Aeris Halaquepts, fine, montmorillonitic (calcareous), mesic—2 percent

### **Characteristics of the Gund Soil**

*Position on landscape:* Lake plain terraces

*Parent material:* Silty mixed alluvium with a large component of loess over clayey lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, bottlebrush squirreltail, shadscale

### Typical Profile

0 to 4 inches—silt loam; platy structure; soft, very friable; strongly alkaline (pH 9.0); strongly saline (75 to 100 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

4 to 23 inches—silt loam; platy structure; hard, firm; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 50 to 80); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

23 to 60 inches or more—silty clay, clay; prismatic structure; hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CH; estimated AASHTO classification—A-7

### Soil and Water Features

*Depth to seasonal high water table:* February through June—60 to 72 inches; rest of year—below 72 inches

*Frequency of flooding:* Rare

*Permeability:* Slow

*Available water capacity:* 8.6 to 10.7 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### Characteristics of the Batan Soil

*Position on landscape:* Alluvial flat remnants

*Parent material:* Kind—alluvium influenced by loess and volcanic ash; source—volcanic rock high in pyroclastics

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, black greasewood, bottlebrush squirreltail

### Typical Profile

0 to 5 inches—silt loam; platy structure; hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 40 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.1 to 12.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Lake plains

*Contrasting features:* Subject to ponding, poorly drained

*Distinctive present vegetation:* Black greasewood

#### Inclusion 2

*Position on landscape:* Channeled areas on alluvial flats

*Contrasting features:* Poorly drained

*Distinctive present vegetation:* Black greasewood, basin wildrye, rubber rabbitbrush

#### Inclusion 3

*Position on landscape:* Slightly concave areas on alluvial flats

*Contrasting features:* Year-round high water table at a depth of less than 10 inches

*Distinctive present vegetation:* Alkali bluegrass, alkali rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Gund soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Batan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Gund Soil for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—too clayey, excess salt, hard to pack

*Shallow excavations:* Moderate—too clayey, wetness  
*Local roads and streets:* Severe—low strength, frost action, shrink-swell  
*Roadfill:* Poor—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt, excess sodium  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Batan Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Severe—low strength  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt, excess sodium  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Interpretive Groups**

*Capability classification:* Gund soil—VIIw, nonirrigated; Batan soil—IIIs, irrigated, and VIIs, nonirrigated  
*Range site:* Gund soil—024X008N; Batan soil—024X003N

### **461—Hapgood-Packer-Layview association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 8,000 to 9,800 feet  
*Average annual precipitation:* About 16 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 50 days

#### **Composition**

##### *Major components:*

- Hapgood very gravelly loam, 30 to 50 percent slopes—Pachic Cryoborolls, loamy-skeletal, mixed—40 percent
  - Packer extremely gravelly loam, 15 to 50 percent slopes—Argic Cryoborolls, loamy-skeletal, mixed—25 percent
  - Layview very gravelly sandy loam, 8 to 15 percent slopes—Argic Lithic Cryoborolls, loamy-skeletal, mixed—15 percent
- Contrasting inclusions:*
- Inclusion 1: Entic Cryumbrepts, 30 to 50 percent

slopes—Entic Cryumbrepts, loamy-skeletal, mixed—7 percent

- Inclusion 2: Rock outcrop—6 percent
- Inclusion 3: Argic Cryoborolls, 15 to 30 percent slopes—Argic Cryoborolls, loamy-skeletal, mixed—5 percent
- Inclusion 4: Rubble land—2 percent

#### **Characteristics of the Hapgood Soil**

*Position on landscape:* Side slopes of mountains  
*Parent material:* Kind—colluvium influenced by volcanic ash over residuum; source—tuff and quartzite  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, lupine, snowberry, Idaho fescue, Letterman needlegrass, mountain brome

#### **Typical Profile**

- 0 to 17 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
- 17 to 40 inches—very gravelly loam; 5 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2
- 40 to 60 inches or more—very cobbly loam, very gravelly loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 4.8 to 6.0 inches  
*Water-supplying capacity:* 16 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—moderate  
*Potential frost action:* Moderate



### **Characteristics of the Packer Soil**

*Position on landscape:* Windswept shoulders and upper side slopes of mountains

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—chert, quartzite, and volcanic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, black sagebrush, Sandberg bluegrass, bluebunch wheatgrass, Idaho fescue

### **Typical Profile**

0 to 10 inches—extremely gravelly loam; 15 to 25 percent cobbles and stones and 70 to 85 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; GP-GC; estimated AASHTO classification—A-2

10 to 21 inches—extremely cobbly clay loam, extremely cobbly loam; 40 to 55 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

21 to 60 inches or more—extremely cobbly loam, extremely cobbly sandy loam; 40 to 55 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 3.6 to 5.4 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Layview Soil**

*Position on landscape:* Windswept crests and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—andesite and tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, black sagebrush, Sandberg bluegrass, low rabbitbrush, Idaho fescue

### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 10 to 15 percent cobbles and stones and 45 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

3 to 12 inches—very gravelly loam, very gravelly clay loam; 10 to 15 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

12 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 0.9 to 1.1 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Sheltered concave snow pockets below shoulder slopes of mountains

*Contrasting features:* Slightly or medium acid throughout the profile

*Distinctive present vegetation:* Lupine, Letterman needlegrass

#### **Inclusion 2**

*Position on landscape:* Scattered peaks and rimrock on shoulder slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Inclusion 3**

*Position on landscape:* Convex lower side slopes of mountains

*Contrasting features:* Horizon of clay accumulation, rock fragments are mostly pebbles

*Distinctive present vegetation:* Low sagebrush, Idaho fescue

### **Inclusion 4**

*Position on landscape:* Side slopes of mountains below rock outcrop

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### **Other inclusions of minor extent**

*Position on landscape:* Concave snow pockets

*Distinctive present vegetation:* Aspen, mountain brome

## **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Hapgood soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Suitability of the Packer soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Layview soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Hapgood Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

### **Ratings of the Packer Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Ratings of the Layview Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, depth to bedrock

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

## **Interpretive Groups**

*Capability classification:* Hapgood soil—VIIIs, nonirrigated; Packer soil—VIIIs, nonirrigated; Layview soil—VIIIs, nonirrigated

*Range site:* Hapgood soil—024X032N; Packer soil—024X016N; Layview soil—024X016N

## **466—Hapgood-Tusel-Winada association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 7,200 to 8,000 feet

*Average annual precipitation:* About 16 inches

*Average annual air temperature:* About 42 degrees F

*Frost-free season:* About 40 days

### **Composition**

*Major components:*

- Hapgood very gravelly loam, 30 to 50 percent slopes—Pachic Cryoborolls, loamy-skeletal, mixed—35 percent
- Tusel very gravelly loam, 30 to 50 percent slopes—Argic Pachic Cryoborolls, loamy-skeletal, mixed—30 percent
- Winada gravelly loam, 50 to 75 percent slopes—Argic Cryoborolls, loamy-skeletal, mixed—25 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—4 percent
- Inclusion 2: Argic Lithic Cryoborolls, 30 to 75 percent slopes—Argic Lithic Cryoborolls, loamy-skeletal, mixed—4 percent
- Inclusion 3: Pachic Cryoborolls, 30 to 50 percent slopes—Pachic Cryoborolls, coarse-loamy, mixed—2 percent

### **Characteristics of the Hapgood Soil**

*Position on landscape:* Side slopes of mountains

**Parent material:** Kind—very gravelly colluvium influenced by volcanic ash; source—tuffs  
**Slope features:** Length—short; shape—concave  
**Dominant present vegetation:** Mountain big sagebrush, snowberry, mountain brome, Sandberg bluegrass, bottlebrush squirreltail, arrowleaf balsamroot

### Typical Profile

- 0 to 17 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
- 17 to 40 inches—very gravelly loam; 5 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2
- 40 to 60 inches or more—very cobbly loam, very gravelly loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

### Soil and Water Features

**Depth to seasonal high water table:** More than 60 inches  
**Frequency of flooding:** None  
**Permeability:** Moderate  
**Available water capacity:** 4.8 to 6.0 inches  
**Water-supplying capacity:** 11 inches  
**Runoff:** Rapid  
**Hydrologic group:** B  
**Erosion factors (surface layer):** K value—.10; T value—5; wind erodibility group—7  
**Hazard of erosion:** By water—moderate; by wind—slight  
**Shrink-swell potential:** Low  
**Corrosivity:** To steel—moderate; to concrete—low  
**Potential frost action:** Moderate

### Characteristics of the Tusel Soil

**Position on landscape:** North-facing side slopes of mountains  
**Parent material:** Kind—very gravelly colluvium and residuum; source—chert, quartzite, and shale  
**Slope features:** Length—short; shape—slightly concave  
**Dominant present vegetation:** Snowberry, mountain big sagebrush, Idaho fescue, lanceleaf rabbitbrush

### Typical Profile

- 0 to 20 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 60 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; slightly acid (pH 6.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2
- 20 to 42 inches—extremely gravelly sandy clay loam, very gravelly clay loam; 15 to 45 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2
- 42 inches—unweathered bedrock

### Soil and Water Features

**Depth to bedrock:** 40 to 60 inches  
**Depth to seasonal high water table:** More than 60 inches  
**Frequency of flooding:** None  
**Permeability:** Moderately slow  
**Available water capacity:** 4.4 to 5.4 inches  
**Water-supplying capacity:** 16 inches  
**Runoff:** Medium  
**Hydrologic group:** B  
**Erosion factors (surface layer):** K value—.15; T value—3; wind erodibility group—7  
**Hazard of erosion:** By water—severe; by wind—slight  
**Shrink-swell potential:** Moderate  
**Corrosivity:** To steel—moderate; to concrete—low  
**Potential frost action:** Moderate

### Characteristics of the Winada Soil

**Position on landscape:** Shoulders and upper side slopes of mountains  
**Parent material:** Kind—very gravelly residuum and colluvium; source—shale  
**Slope features:** Length—short; shape—convex  
**Dominant present vegetation:** Low sagebrush, Douglas rabbitbrush, bluebunch wheatgrass  
**Surface cover:** 30 percent pebbles

### Typical Profile

- 0 to 12 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM, GM-GC, SM-SC; estimated AASHTO classification—A-4
- 12 to 24 inches—very gravelly clay loam; 0 to 5 percent

cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

24 to 36 inches—weathered bedrock

36 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.5 to 3.1 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Very rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Rimrock and scattered peaks

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Ridges and shoulder slopes of mountains

*Contrasting features:* Hard bedrock within a depth of 20 inches

*Distinctive present vegetation:* Low sagebrush, black sagebrush, Sandberg bluegrass

#### **Inclusion 3**

*Position on landscape:* Concave snow pockets and back slopes of mountains

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Mountain big sagebrush, snowberry, Sandberg bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Hapgood soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Suitability of the Tusel soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Suitability of the Winada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Hapgood Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

### **Ratings of the Tusel Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Winada Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slopes

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Hapgood soil—VIIIs, nonirrigated; Tusel soil—VIIIs, nonirrigated; Winada soil—VIIIs, nonirrigated

*Range site:* Hapgood soil—024X032N; Tusel soil—024X023N; Winada soil—024X027N

## **467—Hapgood-Sumine-Cleavage association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 7,000 to 8,600 feet

*Average annual precipitation:* About 15 inches

*Average annual air temperature:* About 42 degrees F  
*Frost-free season:* About 50 days

### **Composition**

#### *Major components:*

- Hapgood very gravelly loam, 30 to 50 percent slopes—Pachic Cryoborolls, loamy-skeletal, mixed—35 percent
- Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—30 percent
- Cleavage extremely gravelly loam, 30 to 75 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Argic Pachic Cryoborolls, 30 to 75 percent slopes—Argic Pachic Cryoborolls, loamy-skeletal, mixed—10 percent
- Inclusion 2: Rock outcrop—3 percent
- Inclusion 3: Pachic Cryoborolls, 15 to 30 percent slopes—Pachic Cryoborolls, fine-loamy, mixed—2 percent

### **Characteristics of the Hapgood Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum influenced by volcanic ash; source—extrusive volcanic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Idaho fescue, mountain brome, slender wheatgrass, mountain big sagebrush

### **Typical Profile**

0 to 17 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

17 to 40 inches—very gravelly loam; 5 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

40 to 60 inches or more—very cobbly loam, very gravelly loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less

than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 4.8 to 6.0 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Sumine Soil**

*Position on landscape:* East-, west-, and south-facing side slopes of mountains

*Parent material:* Kind—residuum; source—chert

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Bluebunch wheatgrass, basin wildrye, mountain big sagebrush

### **Typical Profile**

0 to 6 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

6 to 28 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

28 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.8 to 4.1 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Cleavage Soil**

*Position on landscape:* Crests of mountains  
*Parent material:* Kind—residuum; source—extrusive volcanic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Idaho fescue, low sagebrush, black sagebrush

### **Typical Profile**

0 to 4 inches—extremely gravelly loam; 0 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
 4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 0 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.6 to 1.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing ridges and shoulders of mountains  
*Contrasting features:* Thick, dark colored surface layer,

bedrock at a depth of 20 to 30 inches, lacks a layer of clay accumulation

*Distinctive present vegetation:* Black sagebrush, low sagebrush

#### **Inclusion 2**

*Position on landscape:* Scattered peaks and severely eroded side slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Sheltered, north-facing snow pockets of mountains

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Aspen

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Hapgood soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Hapgood Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

#### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings and the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

**Interpretive Groups**

*Capability classification:* Hapgood soil—VIIIs, nonirrigated; Sumine soil—VIIIs, nonirrigated; Cleavage soil—VIIIs, nonirrigated

*Range site:* Hapgood soil—024X032N; Sumine soil—024X029N; Cleavage soil—024X016N

**482—Humdun-Havingdon-Bucan association****Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,000 to 5,500 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 100 days

**Composition**

*Major components:*

- Humdun silt loam, gravelly substratum, 30 to 50 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, frigid—35 percent

- Havingdon gravelly silt loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—25 percent

- Bucan cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—25 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed, nonacid, frigid—7 percent

- Inclusion 2: Humdun silt loam, 50 to 75 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, frigid—5 percent

- Inclusion 3: Rock outcrop—3 percent

**Characteristics of the Humdun Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—loess influenced by volcanic ash capping colluvium; source—sedimentary tuffs

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

**Typical Profile**

0 to 6 inches—silt loam; platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 24 inches—loam, very fine sandy loam, silt loam; massive; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

24 to 41 inches—loam, very fine sandy loam, silt loam; massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

41 to 60 inches or more—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 10.3 to 12.1 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

**Characteristics of the Havingdon Soil**

*Position on landscape:* South-, east-, and west-facing, upper side slopes of foothills

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—chert

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Bluebunch wheatgrass, Thurber needlegrass, big sagebrush

*Surface cover:* 30 percent pebbles, 10 percent stones

#### **Typical Profile**

0 to 3 inches—gravelly silt loam; 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-4

3 to 22 inches—very gravelly clay, very gravelly sandy clay, extremely gravelly clay loam; 65 to 85 percent pebbles (by weight); massive; very hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

22 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 26 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.8 to 2.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

#### **Characteristics of the Bucan Soil**

*Position on landscape:* South-, east-, and west-facing, lower side slopes of foothills

*Parent material:* Kind—residuum capped with loess influenced by volcanic ash; source—volcanic rock

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

#### **Typical Profile**

0 to 5 inches—cobbly loam; 20 to 25 percent cobbles and stones and 20 to 30 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 15 inches—clay; 0 to 10 percent cobbles and

stones and 10 to 20 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-7

15 to 42 inches—cobbly clay, gravelly clay loam, gravelly clay; 10 to 30 percent cobbles and stones and 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-7

42 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 7.2 to 8.0 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—3; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Narrow canyon bottoms of foothills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

##### **Inclusion 2**

*Position on landscape:* North-facing concave pockets on foothills

*Contrasting features:* Receives additional moisture from drifting snow

*Distinctive present vegetation:* Idaho fescue

##### **Inclusion 3**

*Position on landscape:* Rimrock and scattered peaks of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat



**Wildlife habitat elements:**

*Suitability of the Humdun soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Havingdon soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Bucan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Humdun Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—seepage

**Ratings of the Havingdon Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Bucan Soil for Selected Uses**

*Range seeding:* Fair—droughty, erodes easily

*Daily cover for landfill:* Poor—large stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

**Interpretive Groups**

*Capability classification:* Humdun soil—VIIe, nonirrigated; Havingdon soil—VIIe, nonirrigated; Bucan soil—VIe, nonirrigated

*Range site:* Humdun soil—024X005N; Havingdon soil—024X035N; Bucan soil—024X005N

**486—Havingdon-Burrita association****Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,400 to 6,600 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 100 days

**Composition**

*Major components:*

- Havingdon gravelly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—45 percent

- Burrita extremely cobbly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 30 to 50 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, frigid—5 percent

- Inclusion 2: Bojo extremely gravelly loam, 30 to 50 percent slopes—Lithic Haplargids, loamy, mixed, mesic—5 percent

- Inclusion 3: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent

**Characteristics of the Havingdon Soil**

*Position on landscape:* Side slopes of foothills

*Parent material:* Kind—residuum and colluvium influenced by loess and volcanic ash; source—metavolcanic rocks

*Slope features:* Length—long; shape—concave to smooth

*Dominant present vegetation:* Bluebunch wheatgrass, Thurber needlegrass, big sagebrush

**Typical Profile**

0 to 3 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

3 to 22 inches—very gravelly clay, very gravelly sandy clay, extremely gravelly clay loam; 65 to 85 percent pebbles (by weight); massive; very hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

22 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 20 to 26 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.8 to 2.3 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

**Characteristics of the Burrita Soil**

*Position on landscape:* Shoulders and upper side slopes of foothills  
*Parent material:* Kind—residuum; source—metavolcanic rocks  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

**Typical Profile**

0 to 3 inches—extremely cobbly loam; 40 to 60 percent cobbles and stones and 45 to 70 percent pebbles (by weight); platy; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4  
 3 to 18 inches—very cobbly clay, very stony clay loam, very gravelly clay loam; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7  
 18 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.5 to 2.0 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Drainageways of foothills  
*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 2**

*Position on landscape:* Lower elevation, south-facing foot slopes of foothills  
*Contrasting features:* Soil is loamy, shallow to bedrock, and droughty

*Distinctive present vegetation:* Shadscale

**Inclusion 3**

*Position on landscape:* Higher elevation, south-facing sides slopes of foothills  
*Contrasting features:* Thick surface layer  
*Distinctive present vegetation:* Mountain big sagebrush, globemallow

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Havingdon soil for named elements:*  
 Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Burrita soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Havingdon Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope, too clayey  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Burrita Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones  
*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones  
*Shallow excavations:* Severe—depth to bedrock, large stones, slope  
*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones, slope  
*Sand:* Improbable source—excess fines, large stones  
*Gravel:* Improbable source—excess fines, large stones  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Havingdon soil—VIIe, nonirrigated; Burrita soil—VIIs, nonirrigated  
*Range site:* Havingdon soil—024X035N; Burrita soil—024X005N

## **511—Hessing silt loam**

### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,800 to 5,600 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Hessing silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent
- Inclusion 2: Antel silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—4 percent
- Inclusion 3: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—4 percent
- Inclusion 4: Pumper silt loam, 0 to 2 percent slopes—Typic Camborthids, sandy-skeletal, mixed, mesic—2 percent

### **Characteristics of the Hessing Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Silty alluvium and loess influenced by volcanic ash over coarse mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, pepperweed

### **Typical Profile**

0 to 4 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

4 to 11 inches—silt loam, silty clay loam; prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 5 to 10); estimated Unified classification—CL; estimated AASHTO classification—A-6

11 to 18 inches—very fine sandy loam, silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 5 to 10); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

18 to 30 inches—gravelly loam; 35 to 45 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GM; estimated AASHTO classification—A-4

30 to 60 inches or more—stratified very gravelly loamy coarse sand to extremely gravelly sand; 65 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); strongly saline (16 to 25 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—GP-GM, GW-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 30 inches—moderate; below this depth—very rapid

*Available water capacity:* 6.0 to 7.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—3; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth lower margins of fan skirts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth alluvial flat remnants at lower margins of fan skirts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Indian ricegrass, shadscale, bud sagebrush

**Inclusion 3**

*Position on landscape:* Alluvial flat remnants adjacent to old channels

*Contrasting features:* Silty and calcareous throughout the profile

*Distinctive present vegetation:* Black greasewood, bud sagebrush, shadscale

**Inclusion 4**

*Position on landscape:* Concave areas adjacent to channels

*Contrasting features:* Very gravelly throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily, too sandy

**Interpretive Groups**

*Capability classification:* IIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

**512—Hessing-Relley association****Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,800 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition****Major components:**

- Hessing gravelly silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—55 percent

- Relley silt loam, 0 to 2 percent slopes, frequently flooded—Duric Camborthids, fine-silty, mixed, mesic—30 percent

**Contrasting inclusions:**

- Inclusion 1: Pumper gravelly very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, sandy-skeletal, mixed, mesic—5 percent

- Inclusion 2: Creemon very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent

- Inclusion 3: Antel sandy clay loam, 0 to 2 percent slopes, occasionally flooded—Duric Camborthids, fine-silty, mixed, mesic—5 percent

**Characteristics of the Hessing Soil**

*Position on landscape:* Broad, upper fan skirts

*Parent material:* Loess and silty alluvium over coarse mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

**Typical Profile**

0 to 4 inches—gravelly silt loam; 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

4 to 11 inches—silt loam, silty clay loam; prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6

11 to 18 inches—very fine sandy loam, silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

18 to 30 inches—gravelly loam; 35 to 45 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-4

30 to 60 inches or more—stratified very gravelly loamy coarse sand to extremely gravelly sand; 65 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GP-GM, GW-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 30 inches—moderate; below this depth—very rapid  
*Available water capacity:* 6.0 to 7.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.32; T value—3; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Characteristics of the Relley Soil

*Position on landscape:* Broad, lower fan skirts  
*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Saltbush, bottlebrush squirreltail, Indian ricegrass

### Typical Profile

0 to 8 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4  
 8 to 16 inches—silt loam; 0 to 5 percent pebbles (by weight); prismatic structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4  
 16 to 28 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4  
 28 to 60 inches or more—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to

16 mmhos/cm); slightly to moderately sodic (SAR 20 to 30); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—frequent; duration—very brief; months—December through June  
*Permeability:* Moderate  
*Available water capacity:* 10.8 to 12.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Stream terraces adjacent to fan skirts

*Contrasting features:* Very gravelly and sandy throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Lower margins of fan skirts and inset fans

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Irregularly shaped, active flood plains adjacent to fan skirts

*Contrasting features:* Receives additional moisture during spring runoff

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush, black greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

### Wildlife habitat elements:

*Suitability of the Hessian soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Relley soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Hessing Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt  
*Daily cover for landfill:* Poor—seepage, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage, excess salt

**Ratings of the Relley Soil for Selected Uses**

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Moderate—flooding  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Fair—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—thin layer  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt

**Interpretive Groups**

*Capability classification:* Hessing soil—IIs, irrigated, and VIIs, nonirrigated; Relley soil—IIIw, irrigated, and VIIw, nonirrigated  
*Range site:* Hessing soil—024X002N; Relley soil—024X012N

**530—Humboldt fine sandy loam****Map Unit Setting**

*Position on landscape:* Flood plains  
*Elevation:* 4,450 to 4,600 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Humboldt fine sandy loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcareous), mesic—85 percent
- Contrasting inclusions:*
  - Inclusion 1: Parana silt loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—5 percent
  - Inclusion 2: Rose Creek silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—5 percent

- Inclusion 3: Sonoma silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

**Characteristics of the Humboldt Soil**

*Position on landscape:* Flood plains  
*Parent material:* Silty mixed alluvium influenced by volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Basin wildrye, Nevada bluegrass

**Typical Profile**

0 to 11 inches—fine sandy loam; prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-4  
 11 to 60 inches or more—stratified silty clay loam to clay; 0 to 10 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—MH; estimated AASHTO classification—A-7

**Soil and Water Features**

*Depth to seasonal high water table:* December through July—6 to 24 inches; rest of year—below 24 inches  
*Flooding:* Frequency—frequent; duration—brief or long; months—December through June  
*Permeability:* Moderately slow  
*Available water capacity:* 9.8 to 11.1 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Very slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* High

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Higher areas of flood plains  
*Contrasting features:* Silty throughout the profile  
*Distinctive present vegetation:* Basin wildrye, creeping wildrye

**Inclusion 2**

*Position on landscape:* Areas adjacent to stream channels  
*Contrasting features:* Stratified sand to silt loam throughout the profile

*Distinctive present vegetation:* Basin wildrye, willow, rose

### **Inclusion 3**

*Position on landscape:* Side channels and backwater areas along the outer margins of the delineations

*Contrasting features:* Less organic matter in the surface layer

*Distinctive present vegetation:* Creeping wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—very poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

### **Ratings and Restrictive Features of the Soil for Selected Uses and Practices**

*Range seeding:* Fair—excess salt

*Daily cover for landfill:* Poor—too clayey, wetness, hard to pack

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—flooding, low strength, wetness

*Roadfill:* Poor—low strength, wetness

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—wetness, too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—hard to pack, wetness

*Drainage:* Flooding, frost action, poor outlets

*Irrigation:* Wetness

*Terraces and diversions:* Poor outlets, wetness

### **Interpretive Groups**

*Capability classification:* Vw, irrigated, and Vw, nonirrigated

*Range site:* 025X001N

## **531—Humboldt silty clay**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,450 to 4,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Humboldt silty clay, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcareous), mesic—85 percent

#### *Contrasting inclusions:*

- Inclusion 1: Parana silt loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Rose Creek silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Sonoma silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Humboldt Soil**

*Position on landscape:* Flood plains

*Parent material:* Kind—alluvium; source—dominantly volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Basin wildrye, Nevada bluegrass

### **Typical Profile**

0 to 11 inches—silty clay; prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—MH; estimated AASHTO classification—A-7

11 to 60 inches or more—stratified silty clay loam to clay; 0 to 10 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—MH; estimated AASHTO classification—A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* December through July—6 to 24 inches; rest of year—below 24 inches

*Flooding:* Frequency—frequent; duration—brief or long; months—December through June

*Permeability:* Moderately slow

*Available water capacity:* 10.0 to 11.3 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Very slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Higher areas on flood plains

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Creeping wildrye, sedge, basin wildrye

#### **Inclusion 2**

*Position on landscape:* Areas adjacent to stream channels

*Contrasting features:* Stratified sand to silt loam throughout the profile

*Distinctive present vegetation:* Basin wildrye, rose

#### **Inclusion 3**

*Position on landscape:* Side channels and backwater areas along the outer margins of the delineations

*Contrasting features:* Less organic matter in the surface layer

*Distinctive present vegetation:* Creeping wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—very poor; domestic grasses and legumes (irrigated)—very poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Fair—excess salt, too clayey

*Daily cover for landfill:* Poor—too clayey, wetness, hard to pack

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—flooding, low strength, wetness

*Roadfill:* Poor—low strength, wetness

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—wetness, too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—hard to pack, wetness

*Drainage:* Flooding, percs slowly, poor outlets

*Irrigation:* Wetness

*Terraces and diversions:* Poor outlets, wetness

### **Interpretive Groups**

*Capability classification:* Vw, irrigated, and Vw, nonirrigated

*Range site:* 025X001N

## **532—Humboldt silty clay loam, slightly saline**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,450 to 4,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Humboldt silty clay loam, slightly saline, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcareous), mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Parana silt loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Soolake very fine sandy loam, 0 to 2 percent slopes—Typic Torriorthents, sandy, mixed, mesic—3 percent
- Inclusion 3: Sonoma silt loam, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—2 percent

### **Characteristics of the Humboldt Soil**

*Position on landscape:* Flood plains

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Silver sagebrush, basin wildrye, creeping wildrye, inland saltgrass, alkali sacaton

### **Typical Profile**

0 to 11 inches—silty clay loam; prismatic structure; hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-7

11 to 60 inches or more—stratified silty clay loam to clay; 0 to 10 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.9); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—MH; estimated AASHTO classification—A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* December through June—6 to 24 inches; rest of year—below 24 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June



*Permeability:* Moderately slow  
*Available water capacity:* 10.0 to 11.3 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Very slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Higher areas on flood plains  
*Contrasting features:* Silty throughout the profile  
*Distinctive present vegetation:* Creeping wildrye, basin wildrye

#### **Inclusion 2**

*Position on landscape:* Fan skirts from adjacent fan piedmonts overlaping the flood plains  
*Contrasting features:* Sandy throughout the profile, somewhat excessively drained  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Side channels and backwater areas along the outer margins of the delineations  
*Contrasting features:* Less organic matter in the surface layer  
*Distinctive present vegetation:* Alkali cordgrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—very poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—good; shallow water areas—good

### **Ratings and Restrictive Features of the Soil for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, too clayey  
*Daily cover for landfill:* Poor—too clayey, wetness, hard to pack  
*Shallow excavations:* Severe—wetness  
*Local roads and streets:* Severe—flooding, low strength, wetness  
*Roadfill:* Poor—low strength, wetness  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—wetness, excess salt, too clayey

*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—hard to pack, wetness, excess salt  
*Drainage:* Flooding, frost action  
*Irrigation:* Wetness, erodes easily  
*Terraces and diversions:* Erodes easily, wetness

### **Interpretive Groups**

*Capability classification:* Vw, irrigated, and Vw, nonirrigated  
*Range site:* 025X001N

## **571—Jenor-Blacka very fine sandy loams**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,500 to 4,600 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Jenor very fine sandy loam, 0 to 2 percent slopes—Typic Durorthids, coarse-loamy, mixed, mesic—45 percent
- Blacka very fine sandy loam, 0 to 2 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—40 percent

#### *Contrasting inclusions:*

- Inclusion 1: Jenor very fine sandy loam, 2 to 4 percent slopes—Typic Durorthids, coarse-loamy, mixed, mesic—8 percent
- Inclusion 2: Blacka very fine sandy loam, 2 to 4 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—7 percent

### **Characteristics of the Jenor Soil**

*Position on landscape:* Upper part of fan piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush

### **Typical Profile**

0 to 6 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4  
 6 to 16 inches—fine sandy loam, loam; 0 to 5 percent cobbles and stones and 5 to 25 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH

8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-4  
 16 to 26 inches—fine sandy loam, sandy loam, gravelly loam; 0 to 5 percent cobbles and stones and 10 to 40 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4, A-2  
 26 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

#### **Soil and Water Features**

*Depth to hardpan:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.0 to 3.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.43; T value—2; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

#### **Characteristics of the Blacka Soil**

*Position on landscape:* Lower part of fan piedmont remnants  
*Parent material:* Loess over mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush

#### **Typical Profile**

0 to 8 inches—very fine sandy loam; prismatic structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 2 to 10); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 8 to 21 inches—fine sandy loam, very fine sandy loam; prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
 21 to 31 inches—strongly cemented duripan; massive; very hard, very firm  
 31 to 64 inches or more—stratified sandy loam to loam; massive; slightly hard, very friable; strongly alkaline

(pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to hardpan:* 20 to 26 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 2.9 to 3.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.49; T value—3; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Shoulder slopes of upper fan piedmont remnants  
*Contrasting features:* Slopes of 2 to 4 percent  
*Distinctive present vegetation:* Shadscale, bud sagebrush

##### **Inclusion 2**

*Position on landscape:* Shoulder slopes of lower fan piedmont remnants  
*Contrasting features:* Slopes of 2 to 4 percent  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, recreation

#### **Wildlife habitat elements:**

*Suitability of the Jenor soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetlands plants—poor; shallow water areas—very poor

*Suitability of the Blacka soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features of the Jenor Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Poor—cemented pan  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Moderate—cemented pan  
*Roadfill:* Poor—cemented pan  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—piping  
*Drainage:* Deep to water  
*Irrigation:* Soil blowing, cemented pan  
*Terraces and diversions:* Cemented pan

### **Ratings and Restrictive Features of the Blacka Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Poor—cemented pan  
*Shallow excavations:* Moderate—cemented pan  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—cemented pan, thin layer  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Cemented pan, erodes easily  
*Terraces and diversions:* Cemented pan, erodes easily

### **Interpretive Groups**

*Capability classification:* Jenor soil—IVs, irrigated, and VIIs, nonirrigated; Blacka soil—IVs, irrigated, and VIIs, nonirrigated  
*Range site:* Jenor soil—024X002N; Blacka soil—024X002N

## **573—Jenor-Beoska-Broyles association**

### **Map Unit Setting**

*Position on landscape:* Piedmont slopes  
*Elevation:* 4,600 to 5,600 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*  
 • Jenor very fine sandy loam, 2 to 8 percent slopes—Typic Durorthids, coarse-loamy, mixed, mesic—40 percent

• Beoska very fine sandy loam, 2 to 4 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—25 percent  
 • Broyles very fine sandy loam, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—20 percent

### *Contrasting inclusions:*

• Inclusion 1: Orovada sandy loam, eroded, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—8 percent  
 • Inclusion 2: Tenabo very fine sandy loam, 2 to 4 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—4 percent  
 • Inclusion 3: Durorthidic Xeric Torriorthents, 0 to 2 percent slopes—Durorthidic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—3 percent

### **Characteristics of the Jenor Soil**

*Position on landscape:* Higher summits and shoulder slopes of fan piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 6 inches—very fine sandy loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4  
 6 to 16 inches—fine sandy loam, loam; 0 to 5 percent cobbles and stones and 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-4  
 16 to 26 inches—fine sandy loam, sandy loam, gravelly loam; 0 to 5 percent cobbles and stones and 10 to 40 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4, A-2  
 26 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.0 to 3.7 inches  
*Water-supplying capacity:* 7 inches

*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.43; T value—2; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Beoska Soil**

*Position on landscape:* Lower summits and shoulder slopes of fan piedmont remnants  
*Parent material:* Loess capped mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, small rabbitbrush

### **Typical Profile**

0 to 13 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4  
 13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
 24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2  
 55 to 60 inches or more—stratified gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid  
*Available water capacity:* 7.9 to 9.8 inches  
*Water-supplying capacity:* 7 inches

*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Broyles Soil**

*Position on landscape:* Lower inset fans and fan skirts  
*Parent material:* Loess capped mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, small rabbitbrush

### **Typical Profile**

0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; hard, friable; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 6.3 to 7.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Irregularly shaped inset fans on upper part of map unit  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

**Inclusion 2**

*Position on landscape:* Convex, dissected, highest summits of fan piedmont remnants

*Contrasting features:* Indurated duripan within a depth of 20 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 3**

*Position on landscape:* Areas adjacent to concave, active channels

*Contrasting features:* Droughty soil subject to occasional flash flooding

*Distinctive present vegetation:* Basin big sagebrush, Wyoming big sagebrush, basin wildrye

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Jenor soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Broyles soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings of the Jenor Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

**Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

**Ratings of the Broyles Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

**Interpretive Groups**

*Capability classification:* Jenor soil—IVe, irrigated, and VIIs, nonirrigated; Beoska soil—IIIe, irrigated, and VIIs, nonirrigated; Broyles soil—IIIe, irrigated, and VIIc, nonirrigated

*Range site:* Jenor soil—024X002N; Beoska soil—024X002N; Broyles soil—024X002N

**590—Landco silt loam****Map Unit Setting**

*Position on landscape:* Alluvial flat remnants

*Elevation:* 4,400 to 4,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Landco silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty over clayey, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed, (calcareous), mesic—5 percent

- Inclusion 2: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

- Inclusion 3: Rosney silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

**Characteristics of the Landco Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, Nuttall saltbush, seepweed

### Typical Profile

- 0 to 18 inches—silt loam; prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 18 to 44 inches—silty clay, silty clay loam; prismatic structure; very hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CH, CL; estimated AASHTO classification—A-7
- 44 to 69 inches or more—silt loam; massive; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.64; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Alluvial flat remnants near adjacent alluvial flats  
*Contrasting features:* Silty throughout the profile  
*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 2

*Position on landscape:* Higher areas on alluvial flat remnants near adjacent skirts  
*Contrasting features:* Sandy loam throughout the profile  
*Distinctive present vegetation:* Shadscale, black greasewood

#### Inclusion 3

*Position on landscape:* Outer margins of alluvial flat remnants  
*Contrasting features:* Silty throughout the profile  
*Distinctive present vegetation:* Nuttall saltbush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—hard to pack

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Deep to water

*Irrigation:* Excess salt, percs slowly, erodes easily

*Terraces and diversions:* Erodes easily, percs slowly

### Interpretive Groups

*Capability classification:* IVs, irrigated, and VIIs, nonirrigated

*Range site:* 024X012N

## 602—Misad gravelly sandy loam, strongly saline-sodic

### Map Unit Setting

*Position on landscape:* Fan skirts

*Elevation:* 4,500 to 4,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Misad gravelly sandy loam, strongly saline-sodic, 0 to 2 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

**Characteristics of the Misad Soil**

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, black greasewood

**Typical Profile**

- 0 to 7 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-1, A-2
- 7 to 31 inches—stratified fine sandy loam to very gravelly sandy loam; 5 to 10 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2
- 31 to 60 inches or more—stratified very gravelly loamy sand to extremely gravelly coarse sand; 5 to 10 percent cobbles and stones and 60 to 80 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 2.9 to 4.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Adjacent alluvial flat remnants

*Contrasting features:* Silty throughout the profile, moderately well drained

*Distinctive present vegetation:* Black greasewood, shadscale

**Inclusion 2**

*Position on landscape:* Lower margins of fan skirts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale, black greasewood

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants

(nonirrigated)—very poor; shrubs (nonirrigated)—

very poor; wetland plants—very poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—seepage, small stones, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess salt

*Drainage:* Deep to water

*Irrigation:* Droughty

*Terraces and diversions:* Too sandy

**Interpretive Groups**

*Capability classification:* VIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X003N

**605—Misad-Creemon-Rednik association****Map Unit Setting**

*Position on landscape:* Piedmont slopes

*Elevation:* 4,500 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Misad gravelly loam, 4 to 8 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—35 percent
  - Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—30 percent
  - Rednik silt loam, 4 to 8 percent slopes—Typic Haplargids, loamy-skeletal, mixed, mesic—20 percent
- Contrasting inclusions:*
- Inclusion 1: Xerollic Haplargids, 4 to 8 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—10 percent
  - Inclusion 2: Whirlo very gravelly loam, 4 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—5 percent

**Characteristics of the Misad Soil**

*Position on landscape:* Fan aprons overlaping fan piedmonts

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, cheatgrass

**Typical Profile**

- 0 to 7 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-2, A-4
- 7 to 31 inches—stratified fine sandy loam to very gravelly sandy loam; 5 to 10 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2
- 31 to 60 inches or more—very gravelly loamy sand to extremely gravelly coarse sandy loam; 5 to 10 percent cobbles and stones and 60 to 80 percent pebbles (by weight); single grained; loose; strongly

alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 2.9 to 4.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

**Characteristics of the Creemon Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

**Typical Profile**

- 0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 10 to 15 inches—very fine sandy loam, silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 15 to 45 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4



### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 9.7 to 11.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Characteristics of the Rednik Soil

*Position on landscape:* Nonburied fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush

### Typical Profile

0 to 6 inches—silt loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 6 to 17 inches—very gravelly sandy loam, extremely gravelly loam, very gravelly sandy clay loam; 5 to 30 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; hard, friable; strongly alkaline (pH 8.9); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2  
 17 to 60 inches or more—very gravelly sandy loam, very gravelly sand, extremely gravelly loamy sand; 5 to 30 percent cobbles and stones and 50 to 70 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 17 inches—moderately slow; below this depth—very rapid  
*Available water capacity:* 2.6 to 4.1 inches  
*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Higher, nonburied fan piedmont remnants and fan drainageways

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### Inclusion 2

*Position on landscape:* Upper margins of fan skirts

*Contrasting features:* Very gravelly fine sandy loam substratum, noncalcareous surface and subsoil layers

*Distinctive present vegetation:* Shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Misad soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Creemon soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Rednik soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Misad Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—seepage, small stones, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Creemon Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

#### **Ratings of the Rednik Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Misad soil—IIIs, irrigated, and VIIs, nonirrigated; Creemon soil—IIc, irrigated, and VIIC, nonirrigated; Rednik soil—VIIs, nonirrigated

*Range site:* Misad soil—024X002N; Creemon soil—024X002N; Rednik soil—024X002N

### **631—McConnel-Tulase association**

#### **Map Unit Setting**

*Position on landscape:* Beach plains

*Elevation:* 5,500 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 105 days

#### **Composition**

*Major components:*

- McConnel loam, 0 to 4 percent slopes—Xerollic Camborthids, sandy-skeletal, mixed, mesic—60 percent
- Tulase silt loam, 0 to 2 percent slopes—Durorthidic Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic—30 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Xeric Torriorthents, 0 to 2 percent slopes—Durorthidic Xeric Torriorthents, fine-silty, mixed (calcareous), mesic—4 percent
- Inclusion 2: Durixerollic Camborthids, 0 to 4 percent slopes—Durixerollic Camborthids, coarse-silty, mixed, mesic—3 percent
- Inclusion 3: Bubus very fine sandy loam, 0 to 4

percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent

#### **Characteristics of the McConnel Soil**

*Position on landscape:* Offshore bars

*Parent material:* Mixed alluvium influenced by loess and volcanic ash over beach deposits

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, pine bluegrass, Sandberg bluegrass, bottlebrush squirreltail

#### **Typical Profile**

0 to 2 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

2 to 12 inches—loam, sandy loam, fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

12 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones and 65 to 90 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 12 inches—moderately rapid; below this depth—very rapid

*Available water capacity:* 3.1 to 4.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.37; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

#### **Characteristics of the Tulase Soil**

*Position on landscape:* Lagoons

*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—slightly concave to slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, pine bluegrass, bottlebrush squirreltail, Indian ricegrass

### Typical Profile

0 to 6 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

6 to 60 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 9.1 to 12.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Smooth to slightly concave inset fans dissecting beach plains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye

#### Inclusion 2

*Position on landscape:* Smooth to slightly convex fan skirts at upper margin of beach plains

*Contrasting features:* Noncalcareous in the upper 20 inches

*Distinctive present vegetation:* Basin big sagebrush, black greasewood, basin wildrye

#### Inclusion 3

*Position on landscape:* Adjacent smooth to slightly convex alluvial flat remnants

*Contrasting features:* Loamy throughout the profile  
*Distinctive present vegetation:* Black greasewood, shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

### Wildlife habitat elements:

*Suitability of the McConnel soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Tulase soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the McConnel Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—too sandy, small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Tulase Soil for Selected Uses

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* McConnel soil—IVe, irrigated, and VIIs, nonirrigated; Tulase soil—IIe, irrigated, and VIc, nonirrigated

*Range site:* McConnel soil—024X005N; Tulase soil—024X005N

## 660—Needle Peak silt loam, occasionally flooded

### Map Unit Setting

*Position on landscape:* Flood plains

*Elevation:* 4,700 to 4,800 feet

*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Needle Peak silt loam, 0 to 2 percent slopes, occasionally flooded—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—85 percent

#### *Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, fine-loamy, mixed (calcareous), mesic—7 percent
- Inclusion 2: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 3: Broyles silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—3 percent

### **Characteristics of the Needle Peak Soil**

*Position on landscape:* Flood plains

*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—smooth to slightly concave

*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye, bottlebrush squirreltail, inland saltgrass

### **Typical Profile**

0 to 4 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

4 to 60 inches or more—silt loam, silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* January through May—48 to 72 inches; rest of year—below 72 inches

*Flooding:* Frequency—occasional; duration—brief; months—March through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 13.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Stream terraces

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### **Inclusion 2**

*Position on landscape:* Outer margin of flood plains adjacent to fan skirts

*Contrasting features:* Strongly salt and sodium affected throughout the profile

*Distinctive present vegetation:* Shadscale

#### **Inclusion 3**

*Position on landscape:* Fan skirts adjacent to flood plains

*Contrasting features:* Nonflooded, well drained, and slightly salt and sodium affected

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—fair; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Fair—too clayey

*Shallow excavations:* Moderate—wetness, flooding

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Moderate—piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily, flooding

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* Ilw, irrigated, and Vlw, nonirrigated

*Range site:* 024X006N

## **670—Filiran-Pineval-Kingingham association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,600 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Filiran silt loam, 2 to 4 percent slopes—Haploxerollic Nadurargids, fine, montmorillonitic, mesic—40 percent
- Pineval gravelly fine sandy loam, 4 to 8 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—30 percent

- Kingingham gravelly very fine sandy loam, 2 to 4 percent slopes—Typic Nadurargids, fine, montmorillonitic, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Haplargids, 4 to 15 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—8 percent
- Inclusion 2: Durixerollic Camborthids, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—7 percent

### **Characteristics of the Filiran Soil**

*Position on landscape:* Summits of upper fan piedmont remnants

*Parent material:* Kind—alluvium influenced by loess; source—metavolcanic rocks

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, small rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—silt loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

7 to 12 inches—gravelly silt loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC, GC, SC, SM-SC; estimated AASHTO classification—A-4, A-6  
12 to 33 inches—clay, silty clay loam, gravelly clay; 10 to 30 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7  
33 to 60 inches or more—strongly cemented duripan

### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.7 to 4.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.49; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Pineval Soil**

*Position on landscape:* Fan aprons

*Parent material:* Gravelly mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, Sandberg bluegrass

### **Typical Profile**

0 to 5 inches—gravelly fine sandy loam; 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2

5 to 11 inches—very gravelly loam, very gravelly clay loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2

11 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly sand; 0 to 25 percent cobbles and stones and 50 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/

cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.0 to 4.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Kingingham Soil

*Position on landscape:* Summits of lower fan piedmont remnants  
*Parent material:* Mixed alluvium with a thin loess mantle  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 7 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4  
 7 to 22 inches—gravelly clay loam, gravelly clay, gravelly silty clay loam; 0 to 5 percent cobbles and stones and 30 to 40 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 13 to 30); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7  
 22 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### Soil and Water Features

*Depth to hardpan:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 3.5 to 4.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Clay loam subsoil

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### Inclusion 2

*Position on landscape:* Broad inset fans

*Contrasting features:* Loamy throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Filiran soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Pineval soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Kingingham soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

### Ratings of the Filiran Soil for Selected Uses

*Range seeding:* Poor—excess sodium

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—low strength, shrink-swell, cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, too clayey

*Pond reservoir areas:* Moderate—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer, excess sodium

### Ratings of the Pineval Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—area reclaim, small stones

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Kingingham Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess salt

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—cemented pan, low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, too clayey

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer, excess sodium

#### **Interpretive Groups**

*Capability classification:* Filiran soil—VIIIs, nonirrigated;

Pineval soil—IVe, irrigated, and VIs, nonirrigated;

Kingingham soil—VIIIs, nonirrigated

*Range site:* Filiran soil—028B010N; Pineval soil—028B010N; Kingingham soil—024X002N

### **680—Skullwak-Umberland-Wendane association**

#### **Map Unit Setting**

*Position on landscape:* Basin floor

*Elevation:* 5,600 to 5,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Skullwak silt loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine, montmorillonitic (calcareous), mesic—35 percent
  - Umberland silt loam, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine, montmorillonitic (calcareous), mesic—35 percent
  - Wendane silt loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—15 percent
- Contrasting inclusions:*
- Inclusion 1: Playas—7 percent

- Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Dune land, clayey—3 percent

#### **Characteristics of the Skullwak Soil**

*Position on landscape:* Lake plains

*Parent material:* Fine textured mixed lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Inland saltgrass, alkali bluegrass, alkali rabbitbrush

#### **Typical Profile**

0 to 10 inches—silt loam; platy structure; hard, friable; strongly alkaline (pH 8.8); strongly saline (16 to 40 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

10 to 60 inches or more—stratified silty clay loam to silt loam; massive; very hard, very firm; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

#### **Soil and Water Features**

*Depth to seasonal high water table:* January through December—18 to 36 inches

*Flooding:* Frequency—frequent; duration—brief; months—December through June

*Permeability:* Very slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Moderate

#### **Characteristics of the Umberland Soil**

*Position on landscape:* Lake plains with coppice dunes adjacent to playas

*Parent material:* Mixed lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, inland saltgrass

#### **Typical Profile**

0 to 4 inches—silt loam; platy structure; hard, friable; strongly alkaline (pH 9.0); strongly saline (40 to 60

mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

4 to 60 inches—silty clay, silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 9.2); strongly saline (20 to 40 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

### Soil and Water Features

*Depth to seasonal high water table:* December through June—30 to 60 inches; rest of year—below 60 inches

*Flooding:* Frequency—occasional; duration—long; months—December through June

*Permeability:* Very slow

*Available water capacity:* 9.0 to 12.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### Characteristics of the Wendane Soil

*Position on landscape:* Alluvial flats

*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, basin wildrye, inland saltgrass

### Typical Profile

0 to 13 inches—silt loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (30 to 50 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 27 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

27 to 60 inches or more—stratified silt loam to clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* February through May—30 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—frequent; duration—brief or long; months—December through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Irregularly shaped sink areas and extensions of main playas

*Contrasting features:* Ponded

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Remnants of lake plains

*Contrasting features:* Moderately well drained due to channeling

*Distinctive present vegetation:* Black greasewood, shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Convex parna dunes adjacent to playas

*Contrasting features:* Dune topography, excessively drained, and nonflooded

*Distinctive present vegetation:* Barren except for some scattered black greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Skullwak soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

*Suitability of the Umberland soil for named elements:*

Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

*Suitability of the Wendane soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair



**Ratings of the Skullwak Soil for Selected Uses***Range seeding:* Poor—excess salt, excess sodium*Daily cover for landfill:* Poor—too clayey, hard to pack*Shallow excavations:* Severe—wetness*Local roads and streets:* Severe—low strength, flooding, shrink-swell*Roadfill:* Poor—low strength, shrink-swell*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—excess salt, excess sodium, too clayey*Pond reservoir areas:* Slight*Embankments, dikes, and levees:* Severe—wetness, excess salt, excess sodium**Ratings of the Umlerland Soil for Selected Uses***Range seeding:* Poor—excess salt, excess sodium*Daily cover for landfill:* Poor—too clayey, hard to pack, excess sodium*Shallow excavations:* Moderate—too clayey, flooding, wetness*Local roads and streets:* Severe—low strength, shrink-swell, flooding*Roadfill:* Poor—low strength, shrink-swell*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—excess salt, excess sodium, too clayey*Pond reservoir areas:* Slight*Embankments, dikes, and levees:* Severe—excess salt, excess sodium**Ratings of the Wendane Soil for Selected Uses***Range seeding:* Poor—excess salt, excess sodium*Daily cover for landfill:* Poor—excess salt, excess sodium*Shallow excavations:* Moderate—flooding, wetness*Local roads and streets:* Severe—flooding, frost action*Roadfill:* Poor—low strength*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—excess salt, excess sodium*Pond reservoir areas:* Moderate—seepage*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium**Interpretive Groups***Capability classification:* Skullwak soil—VIIw, nonirrigated; Umlerland soil—VIIw, nonirrigated; Wendane soil—VIIw, nonirrigated*Range site:* Skullwak soil—024X044N; Umlerland soil—024X011N; Wendane soil—024X007N**684—Ocala silt loam, occasionally flooded****Map Unit Setting***Position on landscape:* Lake plains*Elevation:* 5,000 to 5,300 feet*Average annual precipitation:* About 8 inches*Average annual air temperature:* About 50 degrees F*Frost-free season:* About 110 days**Composition***Major components:*

- Ocala silt loam, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 2: Durixerollic Camborthids, 0 to 2 percent slopes—Durixerollic Camborthids, fine-silty, mixed, mesic—3 percent

- Inclusion 3: Aeric Halaquepts, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—2 percent

**Characteristics of the Ocala Soil***Position on landscape:* Lake plains*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash*Slope features:* Length—long; shape—slightly concave*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, inland saltgrass, basin wildrye**Typical Profile**

0 to 13 inches—silt loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML, CL; estimated AASHTO classification—A-4, A-6

13 to 60 inches or more—silt loam, silty clay loam; massive; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

**Soil and Water Features***Depth to seasonal high water table:* February through May—42 to 60 inches; rest of year—below 60 inches*Flooding:* Frequency—occasional; duration—brief or long; months—March through May*Permeability:* Slow*Available water capacity:* 11.4 to 12.6 inches*Water-supplying capacity:* 8 inches*Runoff:* Very slow*Hydrologic group:* C*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly concave margins of alluvial flat remnants adjacent to lake plains

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Black greasewood, shadscale

#### **Inclusion 2**

*Position on landscape:* Fan skirts adjacent to lake plains

*Contrasting features:* Well drained

*Distinctive present vegetation:* Basin big sagebrush, black greasewood, basin wildrye

#### **Inclusion 3**

*Position on landscape:* Lower areas of lake plains

*Contrasting features:* Ponded for brief periods

*Distinctive present vegetation:* Black greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

#### **Ratings for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—wetness, flooding

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Interpretive Groups**

*Capability classification:* VIIw, nonirrigated

*Range site:* 024X007N

## **700—Orovada fine sandy loam, 0 to 2 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Orovada fine sandy loam, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—85 percent

#### *Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—4 percent
- Inclusion 2: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—4 percent
- Inclusion 3: Davey fine sandy loam, 0 to 2 percent slopes—Xerollic Camborthids, sandy, mixed, mesic—4 percent
- Inclusion 4: Goldrun fine sand, 0 to 4 percent slopes—Xeric Torripsamments, mixed, mesic—3 percent

### **Characteristics of the Orovada Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess high in volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); prismatic structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower margins of fan skirts  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Adjacent inset fans  
*Contrasting features:* Silty throughout the profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Sand sheets overlaping fan skirts  
*Contrasting features:* Sandy at a depth of more than 20 inches  
*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 4**

*Position on landscape:* Sand dunes on fan skirts  
*Contrasting features:* Sandy throughout the profile  
*Distinctive present vegetation:* Indian ricegrass, Wyoming big sagebrush

#### **Other inclusions of minor extent**

*Position on landscape:* Adjacent fan piedmont remnants  
*Contrasting features:* Duripan at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Shadscale and bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—poor

#### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Good

*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—frost action  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—small stones, thin layer  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping  
*Drainage:* Deep to water  
*Irrigation:* Soil blowing, erodes easily  
*Terraces and diversions:* Erodes easily, soil blowing

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIc, nonirrigated  
*Range site:* 024X020N

## **701—Orovada fine sandy loam, 2 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,800 to 5,200 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Orovada fine sandy loam, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—85 percent

#### *Contrasting inclusions:*

- Inclusion 1: Davey fine sandy loam, 2 to 4 percent slopes—Xerollic Camborthids, sandy, mixed, mesic—5 percent
- Inclusion 2: Creemon silt loam, 2 to 4 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent
- Inclusion 3: Broyles very fine sandy loam, 2 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

### **Characteristics of the Orovada Soil**

*Position on landscape:* Slightly dissected fan skirts  
*Parent material:* Loess high in volcanic ash over mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, Indian ricegrass, bottlebrush squirreltail, spiny hopsage

#### **Typical Profile**

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles

(by weight); prismatic structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 65 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly convex to slightly concave, slightly dissected sand sheets overlaping fan skirts

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Indian ricegrass, Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Smooth, slightly dissected inset fans dissecting fan skirts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Higher dissected fan skirts

*Contrasting features:* Slightly sodium affected

*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, thin layer

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Soil blowing, slope, erodes easily

*Terraces and diversions:* Erodes easily, soil blowing

### Interpretive Groups

*Capability classification:* IIe, irrigated, and VIc, nonirrigated

*Range site:* 024X020N

### 702—Orovada fine sandy loam, cemented substratum, 0 to 2 percent slopes

#### Map Unit Setting

*Position on landscape:* Fan skirts

*Elevation:* 4,500 to 4,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### Composition

*Major components:*

- Orovada fine sandy loam, cemented substratum, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Blacka very fine sandy loam, 0 to 2 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—4 percent
- Inclusion 2: Broyles very fine sandy loam, 0 to 2

percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—4 percent

- Inclusion 3: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—4 percent

- Inclusion 4: Davey fine sandy loam, 0 to 2 percent slopes—Xerollic Camborthids, sandy, mixed, mesic—3 percent

### **Characteristics of the Orovada Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Douglas rabbitbrush, globemallow

### **Typical Profile**

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 20 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 45 inches or more—stratified fine sandy loam to silt loam; 5 to 20 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-4

45 to 60 inches or more—strongly cemented duripan

### **Soil and Water Features**

*Depth to hardpan:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—3; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent fan piedmont remnants

*Contrasting features:* Strongly cemented duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Shadscale

#### **Inclusion 2**

*Position on landscape:* Lower areas on fan skirts

*Contrasting features:* Lacks cemented substratum

*Distinctive present vegetation:* Shadscale

#### **Inclusion 3**

*Position on landscape:* Adjacent inset fans

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale

#### **Inclusion 4**

*Position on landscape:* Sand sheets overlaping fan skirts

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass

#### **Other inclusions of minor extent**

*Position on landscape:* Adjacent fan piedmont remnants

*Contrasting features:* Indurated duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Shadscale and bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Fair—cemented pan, thin layer

*Shallow excavations:* Moderate—cemented pan

*Local roads and streets:* Moderate—frost action

*Roadfill:* Fair—thin layer, cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage, cemented pan

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Soil blowing, erodes easily

*Terraces and diversions:* Erodes easily, soil blowing

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIc, nonirrigated

*Range site:* 024X020N

## **703—Orovada-Goldrun complex**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,500 to 5,300 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Orovada fine sandy loam, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—45 percent

- Goldrun fine sand, 0 to 4 percent slopes—Xeric Torripsamments, mixed, mesic—45 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

- Inclusion 2: Davey very fine sandy loam, 0 to 2 percent slopes—Xerollic Camborthids, sandy, mixed, mesic—5 percent

### **Characteristics of the Orovada Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Thurber needlegrass, spiny hopsage, Wyoming big sagebrush

### **Typical Profile**

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); prismatic structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to

silt loam; 5 to 25 percent pebbles (by weight);

massive; soft, very friable; strongly alkaline (pH

8.6); slightly saline (4 to 8 mmhos/cm); nonsodic

(SAR less than 5); estimated Unified classification—

SM, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Goldrun Soil**

*Position on landscape:* Sand sheets on fan skirts

*Parent material:* Mixed alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Indian ricegrass, needleandthread, basin big sagebrush

### **Typical Profile**

0 to 7 inches—fine sand; massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

7 to 60 inches or more—fine sand; massive; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* 4.2 to 5.4 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower margins of fan skirts  
*Contrasting features:* Moderately saline profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Lower margins of sand sheets  
*Contrasting features:* Loamy over sandy profile

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability of the Orovada soil for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Suitability of the Goldrun soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

#### **Ratings and Restrictive Features of the Orovada Soil for Selected Uses and Practices**

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—frost action  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—small stones, thin layer  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping  
*Drainage:* Deep to water  
*Irrigation:* Soil blowing, erodes easily  
*Terraces and diversions:* Erodes easily, soil blowing

#### **Ratings and Restrictive Features of the Goldrun Soil for Selected Uses and Practices**

*Range seeding:* Poor—soil blowing, too sandy  
*Daily cover for landfill:* Poor—too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—too sandy

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, seepage

*Drainage:* Deep to water

*Irrigation:* Droughty, fast intake, soil blowing

*Terraces and diversions:* Too sandy, soil blowing

### **Interpretive Groups**

*Capability classification:* Orovada soil—IIc, irrigated, and VIc, nonirrigated; Goldrun soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Orovada soil—024X020N; Goldrun soil—024X001N

## **704—Orovada-Kodra-Puett association**

### **Map Unit Setting**

*Position on landscape:* Piedmont slopes

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Orovada loam, 8 to 15 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—40 percent
- Kodra silt loam, 8 to 15 percent slopes—Haploxerollic Durorthids, coarse-loamy, mixed, mesic—30 percent
- Puett gravelly sandy loam, 15 to 30 percent slopes, very stony—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—7 percent
- Inclusion 2: Xeric Torriorthents, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—3 percent

### **Characteristics of the Orovada Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

### **Typical Profile**

0 to 8 inches—loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than

2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.5 to 9.7 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Kodra Soil**

*Position on landscape:* Upper summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

#### **Typical Profile**

0 to 4 inches—silt loam; 0 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

4 to 30 inches—loam, sandy loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4, A-2

30 to 51 inches or more—strongly cemented duripan; massive; extremely hard, very firm

#### **Soil and Water Features**

*Depth to hardpan:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 4.1 to 5.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Puett Soil**

*Position on landscape:* Side slopes of fan piedmont remnants near locally exposed soft bedrock core

*Parent material:* Kind—residuum; source—soft tuffaceous rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Indian ricegrass, black sagebrush, Wyoming big sagebrush

*Rock fragments on surface:* Kind—stones; percentage of surface covered—2

#### **Typical Profile**

0 to 4 inches—gravelly sandy loam; 5 to 10 percent cobbles and stones and 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

4 to 15 inches—coarse sandy loam, gravelly sandy loam, loam; 10 to 50 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML, GM; estimated AASHTO classification—A-1, A-2, A-4

15 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 1.7 to 2.1 inches

*Water-supplying capacity:* 7 inches



*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Eroded side slopes of fan piedmont remnants with a locally exposed bedrock core

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Inset fans and channels

*Contrasting features:* Very gravelly substratum

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Kodra soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Puett soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Orovada Soil for Selected Uses**

*Range seeding:* Fair—too arid, erodes easily

*Daily cover for landfill:* Fair—slope

*Shallow excavations:* Moderate—slope

*Local roads and streets:* Moderate—frost action, slope

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, slope, thin layer

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Kodra Soil for Selected Uses**

*Range seeding:* Fair—too arid, erodes easily

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Moderate—cemented pan, frost action, slope

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—cemented pan, small stones, thin layer

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Puett Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—seepage, piping

### **Interpretive Groups**

*Capability classification:* Orovada soil—IVe, irrigated, and VIc, nonirrigated; Kodra soil—IVe, irrigated, and VIs, nonirrigated; Puett soil—VIIe, nonirrigated

*Range site:* Orovada soil—024X005N; Kodra soil—024X005N; Puett soil—025X025N

## **705—Orovada-Cremon complex**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,600 to 5,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Orovada fine sandy loam, 2 to 8 percent slopes, eroded—Durixerollic Camborthids, coarse-loamy, mixed, mesic—45 percent

- Cremon silt loam, 2 to 8 percent slopes, eroded—Duric Camborthids, coarse-silty, mixed, mesic—45 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

- Inclusion 2: Davey fine sandy loam, 2 to 4 percent slopes—Xerollic Camborthids, sandy, mixed, mesic—5 percent

### **Characteristics of the Orovada Soil**

*Position on landscape:* Upper fan skirts

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass, Indian ricegrass

### Typical Profile

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Creemon Soil

*Position on landscape:* Lower fan skirts

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass

### Typical Profile

0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 15 inches—very fine sandy loam, silt loam;

subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 45 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 9.7 to 11.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Smooth to convex higher areas of fan skirts

*Contrasting features:* Fine sandy loam subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Smooth to concave sand sheets overplacing parts of fan skirts

*Contrasting features:* Sandy substratum

*Distinctive present vegetation:* Indian ricegrass, needleandthread, big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### Wildlife habitat elements:

*Suitability of the Orovada soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses

and legumes (irrigated)—fair; wild herbaceous plants—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Suitability of the Creemon soil for named elements:*

Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

**Ratings and Restrictive Features of the Orovada Soil for Selected Uses and Practices**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, thin layer

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Soil blowing, slope, erodes easily

*Terraces and diversions:* Erodes easily, soil blowing

**Ratings and Restrictive Features of the Creemon Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Slope, erodes easily, excess salt

*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* Orovada soil—IIIe, irrigated, and VIc, nonirrigated; Creemon soil—IIIe, irrigated, and VIIc, nonirrigated

*Range site:* Orovada soil—024X020N; Creemon soil—024X002N

**706—Orovada-Wieland-Chiara association**

**Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,500 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 105 days

**Composition**

*Major components:*

- Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—45 percent

- Wieland gravelly loam, 2 to 8 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—25 percent

- Chiara fine sandy loam, 2 to 8 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—15 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Camborthids, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-silty, mixed, mesic—8 percent

- Inclusion 2: Aridic Haploxerolls, 2 to 4 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, mesic—5 percent

- Inclusion 3: Xeric Torriorthents, 2 to 4 percent slopes—Xeric Torriorthents, sandy-skeletal, mixed, mesic—2 percent

**Characteristics of the Orovada Soil**

*Position on landscape:* Broad inset fans

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bluegrass, Indian ricegrass

**Typical Profile**

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 8.4 to 9.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

**Characteristics of the Wieland Soil**

*Position on landscape:* Summits and shoulder slopes of upper fan piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess  
*Slope features:* Length—short; shape—smooth to convex  
*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, Indian ricegrass

**Typical Profile**

0 to 5 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6  
 5 to 26 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CH, SC; estimated AASHTO classification—A-7  
 26 to 52 inches—gravelly sandy clay loam, gravelly clay loam; 0 to 5 percent cobbles and stones and 30 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.5); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6  
 52 to 60 inches or more—loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4, A-2

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 5.7 to 9.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

**Characteristics of the Chiara Soil**

*Position on landscape:* Summits of lower fan piedmont remnants  
*Parent material:* Loess mantle high in volcanic ash over mixed alluvium  
*Slope features:* Length—short; smooth to slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, pine bluegrass, Indian ricegrass, bottlebrush squirreltail

**Typical Profile**

0 to 5 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4  
 5 to 16 inches—very fine sandy loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 16 inches—indurated duripan; massive; extremely hard, extremely firm

**Soil and Water Features**

*Depth to hardpan:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.4 to 2.8 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth to slightly convex fan skirts adjacent to fan piedmonts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth to slightly concave higher parts of inset fans

*Contrasting features:* Very deep, very gravelly

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### **Inclusion 3**

*Position on landscape:* Adjacent to concave channels

*Contrasting features:* Very gravelly sand throughout the profile

*Distinctive present vegetation:* Basin big sagebrush, rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Wieland soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Chiara soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Orovada Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, thin layer

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Wieland Soil for Selected Uses**

*Range seeding:* Poor—rooting depth

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Moderate—thin layer

#### **Ratings of the Chiara Soil for Selected Uses**

*Range seeding:* Fair—droughty

*Daily cover for landfill:* Poor—cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan

*Pond reservoir areas:* Severe—cemented pan

*Embankments, dikes, and levees:* Severe—frost action, piping, thin layer

### **Interpretive Groups**

*Capability classification:* Orovada soil—IIIe, irrigated, and VIc, nonirrigated; Wieland soil—IIIe, irrigated, and VIs, nonirrigated; Chiara soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Orovada soil—024X005N; Wieland soil—024X005N; Chiara soil—024X005N

## **707—Orovada-Goldrun association**

### **Map Unit Setting**

*Position on landscape:* Interhill alluvial fans

*Elevation:* 4,500 to 5,500 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—70 percent

- Goldrun fine sand, 4 to 15 percent slopes—Xeric Torripsamments, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, fine-loamy, mixed, mesic—5 percent

- Inclusion 2: Durixerollic Camborthids, stony very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—4 percent

- Inclusion 3: Rock outcrop—1 percent

### **Characteristics of the Orovada Soil**

*Position on landscape:* Alluvial fans

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Thurber needlegrass,  
Wyoming big sagebrush, bluebunch wheatgrass

### Typical Profile

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); prismatic structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Goldrun Soil

*Position on landscape:* Sand sheets overplacing alluvial fans

*Parent material:* Mixed eolian sands influenced by volcanic ash

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Indian ricegrass, basin big sagebrush, needleandthread

### Typical Profile

0 to 7 inches—fine sand; massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—SM; estimated AASHTO classification—A-2

7 to 60 inches or more—fine sand; massive; slightly hard, very friable; moderately alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* 4.2 to 5.4 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Alluvial fan remnants

*Contrasting features:* Clay loam subsoil

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Upper margins of alluvial fans

*Contrasting features:* Stony surface layer

*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

#### Inclusion 3

*Position on landscape:* Nonburied, scattered bedrock outcroppings of hills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Goldrun soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Orovada Soil for Selected Uses

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—small stones, thin layer  
*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Goldrun Soil for Selected Uses**

*Range seeding:* Poor—soil blowing, too sandy  
*Daily cover for landfill:* Poor—too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—slope  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—too sandy  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping, seepage

#### **Interpretive Groups**

*Capability classification:* Orovada soil—IIIe, irrigated, and VIc, nonirrigated; Goldrun soil—IVs, irrigated, and VIIs, nonirrigated  
*Range site:* Orovada soil—024X005N; Goldrun soil—024X001N

### **708—Orovada-Reina-Rock outcrop association**

#### **Map Unit Setting**

*Position on landscape:* Foothills  
*Elevation:* 5,000 to 6,000 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

#### **Composition**

##### **Major components:**

- Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—45 percent
- Reina loam, 15 to 30 percent slopes—Xerollic Durargids, clayey-skeletal, montmorillonitic, mesic, shallow—25 percent
- Rock outcrop—20 percent

##### **Contrasting inclusions:**

- Inclusion 1: Xeric Torriorthents, 15 to 50 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 2: Xerollic Camborthids, 30 to 50 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

#### **Characteristics of the Orovada Soil**

*Position on landscape:* Inset fans between foothills  
*Parent material:* Loess high in volcanic ash over mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, spiny hopsage

#### **Typical Profile**

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4  
 8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
 20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 8.4 to 9.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

#### **Characteristics of the Reina Soil**

*Position on landscape:* East-, west-, and south-facing side slopes of foothills  
*Parent material:* Kind—residuum; source—andesite, basalt, tuffs, and quartzite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, spiny hopsage, Thurber needlegrass

### Typical Profile

- 0 to 7 inches—loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
- 7 to 18 inches—very gravelly clay, very gravelly clay loam; 10 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); prismatic structure; very hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2, A-7
- 18 to 26 inches—indurated duripan; massive; very hard, very firm
- 26 inches—unweathered bedrock

### Soil and Water Features

- Depth to hardpan:* 14 to 20 inches
- Depth to bedrock:* 22 to 30 inches
- Depth to seasonal high water table:* More than 60 inches
- Frequency of flooding:* None
- Permeability:* Slow
- Available water capacity:* 2.0 to 2.6 inches
- Water-supplying capacity:* 8 inches
- Runoff:* Rapid
- Hydrologic group:* D
- Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—5
- Hazard of erosion:* By water—slight; by wind—slight
- Shrink-swell potential:* Moderate
- Corrosivity:* To steel—high; to concrete—low
- Potential frost action:* Low

### Characteristics of Rock Outcrop

- Position on landscape:* Rimrock and eroded side slopes of foothills
- Slope features:* Length—short; concave to convex
- Dominant present vegetation:* Barren

### Contrasting Inclusions

#### Inclusion 1

- Position on landscape:* Colluvial foot slopes of foothills
- Contrasting features:* Deep, very gravelly
- Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

- Position on landscape:* North-facing side slopes of foothills
- Contrasting features:* Moderately deep to bedrock
- Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

- Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
- Suitability of the Reina soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Orovada Soil for Selected Uses

- Range seeding:* Fair—too arid
- Daily cover for landfill:* Good
- Shallow excavations:* Slight
- Local roads and streets:* Moderate—frost action
- Roadfill:* Good
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Fair—small stones, thin layer
- Pond reservoir areas:* Moderate—seepage, slope
- Embankments, dikes, and levees:* Severe—piping

#### Ratings of the Reina Soil for Selected Uses

- Range seeding:* Poor—droughty
- Daily cover for landfill:* Poor—slope, depth to bedrock, small stones
- Shallow excavations:* Severe—cemented pan, depth to bedrock, slope
- Local roads and streets:* Cemented pan, slope
- Roadfill:* Poor—cemented pan, depth to bedrock
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Poor—cemented pan, small stones, slope
- Pond reservoir areas:* Severe—cemented pan, slope
- Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

- Capability classification:* Orovada soil—IIIe, irrigated, and VIc, nonirrigated; Reina soil—IVe, irrigated, and VIIe, nonirrigated
- Range site:* Orovada soil—024X020N; Reina soil—024X005N

### 709—Orovada-Sodhouse association

#### Map Unit Setting

- Position on landscape:* Piedmont slopes
- Elevation:* 4,400 to 4,800 feet
- Average annual precipitation:* About 8 inches
- Average annual air temperature:* About 48 degrees F
- Frost-free season:* About 110 days



### **Composition**

#### *Major components:*

- Orovada fine sandy loam, 8 to 15 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—50 percent
- Sodhouse stony very fine sandy loam, 8 to 15 percent slopes—Typic Durorthids, loamy, mixed, mesic, shallow—40 percent

#### *Contrasting inclusions:*

- Inclusion 1: Xerollic Durorthids, 8 to 15 percent slopes—Xerollic Durorthids, coarse-loamy, mixed, mesic—10 percent

### **Characteristics of the Orovada Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, basin wildrye, bottlebrush squirreltail

#### **Typical Profile**

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); prismatic structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Sodhouse Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

*Surface cover:* 2 percent stones

#### **Typical Profile**

0 to 10 inches—stony very fine sandy loam; 5 to 15 percent cobbles and stones and 10 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, GM, SM; estimated AASHTO classification—A-4

10 to 17 inches—fine sandy loam, loam, very fine sandy loam; 10 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

17 to 29 inches—indurated duripan; massive

29 to 60 inches or more—extremely gravelly sandy loam, very gravelly loamy sand; 5 to 20 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; very hard, firm; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.1 to 2.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.49; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* On-fan drainageways of fan piedmont remnants

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Sodhouse soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Orovada Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Fair—slope

*Shallow excavations:* Moderate—slope

*Local roads and streets:* Moderate—frost action, slope

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, slope, thin layer

*Pond reservoir areas:* Slope

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Sodhouse Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty

*Daily cover for landfill:* Poor—cemented pan, seepage, small stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan, small stones, area reclaim

*Pond reservoir areas:* Severe—slope, cemented pan, seepage

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Orovada soil—IVe, irrigated, and VIc, nonirrigated; Sodhouse soil—VIIs, nonirrigated

*Range site:* Orovada soil—024X020N; Sodhouse soil—024X002N

## **711—Paranat silty clay loam**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,400 to 4,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 100 days

### **Composition**

*Major components:*

- Paranat silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Humboldt silty clay loam, moderately saline, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcareous), mesic—5 percent
- Inclusion 2: Rose Creek silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Sonoma silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Paranat Soil**

*Position on landscape:* Flood plains

*Parent material:* Silty mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Spikerush, sedge, rush, curly dock, creeping wildrye, inland saltgrass

### **Typical Profile**

0 to 20 inches—silty clay loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-6, A-7

20 to 48 inches—stratified silty clay loam to silt loam; prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

48 to 60 inches or more—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* November through

June—18 to 42 inches; rest of year—below 42 inches

*Flooding:* Frequency—frequent; duration—brief or long; months—December through June

*Permeability:* Moderately slow

*Available water capacity:* 11.5 to 13.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Depressions and backwater channels on flood plains

*Contrasting features:* Clayey throughout the profile

*Distinctive present vegetation:* Silver sagebrush

#### **Inclusion 2**

*Position on landscape:* Small irregularly shaped areas adjacent to channels

*Contrasting features:* Lower water table during spring

*Distinctive present vegetation:* Sedges

#### **Inclusion 3**

*Position on landscape:* Small irregularly shaped areas on flood plains along the outer margin of the delineation

*Contrasting features:* Less organic matter in the surface layer

*Distinctive present vegetation:* Sedge, rose

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—very poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Fair—excess salt

*Daily cover for landfill:* Fair—too clayey, wetness

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, wetness

*Drainage:* Flooding, frost action

*Irrigation:* Wetness, erodes easily, flooding

*Terraces and diversions:* Erodes easily, wetness

### **Interpretive Groups**

*Capability classification:* Vw, irrigated, and Vw, nonirrigated

*Range site:* 025X001N

## **713—Paranat silty clay loam, drained**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,400 to 4,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Paranat silty clay loam, drained, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Sonoma silty clay loam, drained, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—10 percent

- Inclusion 2: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Paranat Soil**

*Position on landscape:* Deeply incised and channeled flood plain remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Basin wildrye, alkali sacaton, black greasewood

### **Typical Profile**

0 to 20 inches—silty clay loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly to moderately sodic (SAR 15 to 30); estimated Unified classification—ML; estimated AASHTO classification—A-6, A-7  
20 to 60 inches or more—silty clay loam, silt loam;

massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to seasonal high water table:* February through May—60 to 72 inches; rest of year—below 72 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.5 to 13.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Outer margins of flood plain remnants

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Black greasewood, basin wildrye

#### Inclusion 2

*Position on landscape:* Alluvial flat remnants adjacent to flood plains

*Contrasting features:* Strongly sodic upper soil profile

*Distinctive present vegetation:* Black greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt

*Shallow excavations:* Moderate—wetness

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### Interpretive Groups

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X007N

## 714—Paranat silty clay loam, occasionally flooded

### Map Unit Setting

*Position on landscape:* Flood plains

*Elevation:* 4,400 to 4,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Paranat silty clay loam, 0 to 2 percent slopes, occasionally flooded—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Rixie silty clay loam, 0 to 2 percent slopes—Aquic Duric Haploxerolls, fine-loamy, mixed, mesic—10 percent
- Inclusion 2: Sonoma silty clay loam, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

### Characteristics of the Paranat Soil

*Position on landscape:* Flood plains

*Parent material:* Silty mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, silver sagebrush, creeping wildrye, inland saltgrass, alkali sacaton, basin wildrye

### Typical Profile

0 to 20 inches—silty clay loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm);

nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-6, A-7

20 to 48 inches—stratified silty clay loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

48 to 60 inches or more—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to seasonal high water table:* November through July—18 to 42 inches; rest of year—below 42 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—December through May

*Permeability:* Moderately slow

*Available water capacity:* 11.5 to 13.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Adjacent to backwater channels

*Contrasting features:* Frequently flooded for short periods in early spring

*Distinctive present vegetation:* Sedges

#### Inclusion 2

*Position on landscape:* Small higher areas of flood plains

*Contrasting features:* Less organic matter in the surface layer

*Distinctive present vegetation:* Alkali cordgrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—very poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Fair—excess salt

*Daily cover for landfill:* Fair—too clayey, wetness

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, wetness

*Drainage:* Flooding, frost action

*Irrigation:* Wetness, erodes easily, flooding

*Terraces and diversions:* Erodes easily, wetness

### Interpretive Groups

*Capability classification:* Vw, irrigated, and Vw, nonirrigated

*Range site:* 024X007N

## 731—Yipor silt loam, moderately saline-sodic

### Map Unit Setting

*Position on landscape:* Fan skirts

*Elevation:* 4,600 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Yipor silt loam, moderately saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 2: Landco silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty over clayey, mixed (calcareous), mesic—3 percent

- Inclusion 3: Rosney silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—2 percent

### Characteristics of the Yipor Soil

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by loess

*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, shadscale, bud sagebrush

### Typical Profile

0 to 8 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 8 to 60 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; moderately to strongly saline (8 to 25 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* 9.4 to 11.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Alluvial flat remnants adjacent to fan skirts

*Contrasting features:* Moderately well drained, silty clay loam substratum

*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 2

*Position on landscape:* Depressional areas adjacent to lower margins of fan skirts

*Contrasting features:* Clayey substratum

*Distinctive present vegetation:* Saltbush

#### Inclusion 3

*Position on landscape:* Shallow fan drainageways

*Contrasting features:* Strongly saline surface layer

*Distinctive present vegetation:* Saltbush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### Interpretive Groups

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X003N

## 740—Playas

### Map Unit Setting

*Position on landscape:* Bolson floors

*Elevation:* 4,500 to 5,600 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 100 days

### Composition

*Major components:*

- Playas—100 percent

### Characteristics of the Playas

*Position on landscape:* Lowest sink area of bolson floors

*Slope features:* Length—long; shape—smooth or slightly concave

*Dominant present vegetation:* None

**770—Prida silt loam****Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,400 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Prida silt loam, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed, (calcareous), mesic—5 percent
- Inclusion 3: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent
- Inclusion 4: Duffer very fine sandy loam, 0 to 2 percent slopes—Aquic Calciorthids, fine-silty, carbonatic, mesic—2 percent

**Characteristics of the Prida Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Silty mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, saltbush, seepweed, inland saltgrass, alkali sacaton

**Typical Profile**

- 0 to 7 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (30 to 50 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
- 7 to 60 inches or more—silt loam, silty clay loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 40 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-6, A-4, A-7

**Soil and Water Features**

*Depth to seasonal high water table:* January through December—36 to 60 inches; rest of year—below 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Low areas of alluvial flats

*Contrasting features:* Water table at a depth of 30 to 36 inches throughout the year

*Distinctive present vegetation:* Black greasewood, basin wildrye

**Inclusion 2**

*Position on landscape:* Alluvial flat remnants

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Black greasewood, shadscale

**Inclusion 3**

*Position on landscape:* Alluvial flat remnants

*Contrasting features:* Well drained

*Distinctive present vegetation:* Black greasewood, shadscale

**Inclusion 4**

*Position on landscape:* Stream terraces adjacent to alluvial flats

*Contrasting features:* Horizon of calcium carbonate accumulation

*Distinctive present vegetation:* Alkali sacaton, saltbush

**Other inclusions of minor extent**

*Position on landscape:* Lower alluvial flat remnants

*Contrasting features:* Clayey substratum

*Distinctive present vegetation:* Alkali sacaton, saltbush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt  
*Shallow excavations:* Moderate—too clayey, wetness  
*Local roads and streets:* Severe—low strength, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—piping, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Percs slowly, erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated  
*Range site:* 024X010N

## **774—Prida-Sonoma silty clay loams**

### **Map Unit Setting**

*Position on landscape:* Basin floor  
*Elevation:* 4,400 to 4,800 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Prida silty clay loam, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—60 percent
- Sonoma silty clay loam, strongly saline, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—30 percent

#### *Contrasting inclusions:*

- Inclusion 1: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Prida Soil**

*Position on landscape:* Alluvial flats  
*Parent material:* Silty mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, saltbush, iodinebush, inland saltgrass, alkali sacaton

### **Typical Profile**

0 to 7 inches—silty clay loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (30 to 50 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 7 to 62 inches or more—silt loam, silty clay loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 40 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-6, A-4, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* January through December—36 to 60 inches; rest of year—below 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* High

### **Characteristics of the Sonoma Soil**

*Position on landscape:* Flood plains  
*Parent material:* Silty mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Alkali sacaton, alkali muhly

### **Typical Profile**

0 to 8 inches—silty clay loam; subangular blocky structure; hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 60 to 80); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
 8 to 60 inches or more—silty clay loam, silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through



June—18 to 36 inches; rest of year—below 36 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Low areas of alluvial flats adjacent to flood plains

*Contrasting features:* Strongly sodium affected in the upper part of the profile, slightly affected in the lower part

*Distinctive present vegetation:* Black greasewood, basin wildrye

#### **Inclusion 2**

*Position on landscape:* Alluvial flat remnants adjacent to flood plains

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Black greasewood, shadscale

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture

#### **Wildlife habitat elements:**

*Suitability of the Prida soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

*Suitability of the Sonoma soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### **Ratings and Restrictive Features of the Prida Soil for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt

*Shallow excavations:* Moderate—too clayey, wetness

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Percs slowly, erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### **Ratings and Restrictive Features of the Sonoma Soil for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Fair—too clayey, wetness

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—excess salt, too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, wetness

*Drainage:* Percs slowly, flooding, frost action

*Irrigation:* Wetness, perc slowly, erodes easily

*Terraces and diversions:* Erodes easily, wetness

### **Interpretive Groups**

*Capability classification:* Prida soil—VIw, irrigated, and VIIw, nonirrigated; Sonoma soil—VIw, irrigated, and VIIw, nonirrigated

*Range site:* Prida soil—024X010N; Sonoma soil—024X009N

## **780—Pumper silt loam**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,800 to 5,100 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

• Pumper silt loam, 0 to 2 percent slopes—Typic Camborthids, sandy-skeletal, mixed, mesic—85 percent

*Contrasting inclusions:*

• Inclusion 1: Creemon silt loam, 0 to 2 percent

slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent

- Inclusion 2: Hessing silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent

### **Characteristics of the Pumper Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess high in volcanic ash over sandy mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 12 inches—silt loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4

12 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sand; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; hard, friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 3.1 to 4.8 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth, slightly higher fan-skirt remnants

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth, fan drainageways of fan skirts

*Contrasting features:* Loamy throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Lower margins of fan skirts

*Contrasting features:* Silty clay loam subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Poor—too sandy, small stones, seepage

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—too arid, area reclaim, small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

*Drainage:* Deep to water

*Irrigation:* Droughty

*Terraces and diversions:* Erodes easily, too sandy

### **Interpretive Groups**

*Capability classification:* IVs, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

## **800—Raglan silt loam, gravelly substratum**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,600 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Raglan silt loam, gravelly substratum, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—85 percent

#### Contrasting inclusions:

- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent
- Inclusion 3: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent

### Characteristics of the Raglan Soil

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 8 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 47 inches—stratified fine sandy loam to silt loam; 0 to 5 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6

47 to 60 inches or more—stratified gravelly sandy loam to very gravelly coarse sand; 40 to 60 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 8.3 to 9.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper margins of fan skirts

*Contrasting features:* Slightly coarser textured subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Adjacent smooth inset fans

*Contrasting features:* Silt loam subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Lower margins of fan skirts

*Contrasting features:* Silt loam subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—thin layer

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—low strength

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Moderate—excess salt, thin layer, piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

## **804—Raglan silty clay loam, moderately saline**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Raglan silty clay loam, moderately saline, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—4 percent
- Inclusion 3: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—3 percent
- Inclusion 4: Rosney silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—3 percent

### **Characteristics of the Raglan Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loamy mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, seepweed

### **Typical Profile**

- 0 to 8 inches—silty clay loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-7
- 8 to 47 inches—stratified fine sandy loam to silt loam; 0 to 5 percent pebbles (by weight); massive; hard,

friable; strongly alkaline (pH 8.8); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6

47 to 60 inches or more—stratified gravelly sandy loam to very gravelly coarse sand; 40 to 60 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 8.3 to 9.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Upper margins of fan skirts

*Contrasting features:* Fine sandy loam throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Adjacent inset fans

*Contrasting features:* Silt loam throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Fan skirt remnants

*Contrasting features:* Silt loam throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 4**

*Position on landscape:* Alluvial flat remnants adjacent to fan skirts

*Contrasting features:* Silty clay loam substratum

*Distinctive present vegetation:* Saltbush

#### **Other inclusions of minor extent**

*Position on landscape:* Small depressional areas and extensions of the main playas

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat; irrigated cropland

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

#### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—thin layer

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—low strength

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Moderate—excess salt, thin layer, piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### Interpretive Groups

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X003N

## 805—Raglan silt loam

### Map Unit Setting

*Position on landscape:* Fan skirts

*Elevation:* 4,700 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Raglan silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Antel silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—4 percent
- Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—4 percent

- Inclusion 3: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—4 percent
- Inclusion 4: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—3 percent

### Characteristics of the Raglan Soil

*Position on landscape:* Broad fan skirts

*Parent material:* Loess high in volcanic ash over mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush

### Typical Profile

0 to 6 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

6 to 14 inches—silt loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

14 to 60 inches or more—stratified very fine sandy loam to silty clay loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, ML; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.3 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper margins of fan skirts

*Contrasting features:* Silty substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Alluvial flats adjacent to fan skirts

*Contrasting features:* Strongly saline surface layers

*Distinctive present vegetation:* Black greasewood, shadscale

#### **Inclusion 3**

*Position on landscape:* Recent adjacent alluvial flats

*Contrasting features:* Very fine sandy loam substratum

*Distinctive present vegetation:* Shadscale, black greasewood

#### **Inclusion 4**

*Position on landscape:* Remnants of fan skirts adjacent to alluvial flats

*Contrasting features:* Silt loam substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

#### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Fair—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

## **814—Quarz-Linrose-Slaven association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,400 to 7,600 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Quarz very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—40 percent

- Linrose very gravelly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—30 percent

- Slaven extremely gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—15 percent

*Contrasting inclusions:*

- Inclusion 1: Aridic Haploxerolls, 8 to 30 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent

- Inclusion 2: Glean gravelly silt loam, 30 to 50 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent

- Inclusion 3: Rock outcrop—3 percent

- Inclusion 4: Rubble land—2 percent

### **Characteristics of the Quarz Soil**

*Position on landscape:* East-, west-, and upper south-facing side slopes of mountains

*Parent material:* Kind—residuum; source—shale and sandstone

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Sandberg bluegrass

*Surface cover:* 15 percent pebbles

### **Typical Profile**

0 to 7 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

7 to 26 inches—very gravelly clay, very gravelly clay loam; 0 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR

less than 2); estimated Unified classification—GC;  
estimated AASHTO classification—A-2, A-7  
26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 2.2 to 2.7 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—  
2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Linrose Soil

*Position on landscape:* North-facing side slopes of  
mountains  
*Parent material:* Kind—residuum and colluvium;  
source—chert, shale and quartzite  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Black sagebrush, Idaho  
fescue, Indian ricegrass, rabbitbrush

### Typical Profile

0 to 8 inches—very gravelly loam; 0 to 15 percent  
cobbles and stones and 50 to 65 percent pebbles  
(by weight); platy structure; slightly hard, friable;  
mildly alkaline (pH 7.8); nonsaline (less than 2  
mmhos/cm); nonsodic (SAR less than 2); estimated  
Unified classification—GM; estimated AASHTO  
classification—A-2, A-4, A-1  
8 to 26 inches—very gravelly loam, very gravelly sandy  
loam; 0 to 15 percent cobbles and stones and 50 to  
70 percent pebbles (by weight); subangular blocky  
structure; slightly hard, friable; mildly alkaline (pH  
7.6); nonsaline (less than 2 mmhos/cm); nonsodic  
(SAR less than 2); estimated Unified classification—  
GC, GM-GC; estimated AASHTO classification—A-2  
26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.2 to 3.4 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—  
2; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Slaven Soil

*Position on landscape:* Lower, south-facing side slopes  
of mountains  
*Parent material:* Kind—residuum; source—chert, shale,  
and quartzite  
*Slope features:* Length—long; shape—concave to  
convex  
*Dominant present vegetation:* Mountain big sagebrush,  
bluebunch wheatgrass, Sandberg bluegrass

### Typical Profile

0 to 5 inches—extremely gravelly loam; 10 to 20  
percent cobbles and stones and 75 to 85 percent  
pebbles (by weight); subangular blocky structure;  
soft, very friable; neutral (pH 6.8); nonsaline (less  
than 2 mmhos/cm); nonsodic (SAR less than 2);  
estimated Unified classification—GC; estimated  
AASHTO classification—A-2  
5 to 22 inches—extremely gravelly clay, extremely  
gravelly sandy clay, extremely gravelly clay loam;  
75 to 85 percent pebbles (by weight); subangular  
blocky structure; hard, friable; neutral (pH 7.0);  
nonsaline (less than 2 mmhos/cm); nonsodic (SAR  
less than 2); estimated Unified classification—GC;  
estimated AASHTO classification—A-2  
22 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 2.0 to 2.6 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.10; T value—  
2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests and shoulder slopes of mountains

*Contrasting features:* Very cobbly surface layer

*Distinctive present vegetation:* Low sagebrush

#### **Inclusion 2**

*Position on landscape:* Concave snow pockets below shoulder slopes of mountains

*Contrasting features:* Thick, dark colored surface layer

*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush

#### **Inclusion 3**

*Position on landscape:* Rimrock and scattered peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 4**

*Position on landscape:* Rock screes below rimrock

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Quarz soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Linrose soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Slaven soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Quarz Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—thin layer, large stones

#### **Ratings of the Linrose Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Slaven Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, too clayey, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Quarz soil—VIIIs, nonirrigated; Linrose soil—VIIIs, nonirrigated; Slaven soil—VIIIs, nonirrigated

*Range site:* Quarz soil—024X029N; Linrose soil—024X042N; Slaven soil—024X029N

## **816—Quarz-Linrose-Cleavage association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,500 to 7,900 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Quarz cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—50 percent
- Linrose very cobbly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—20 percent
- Cleavage extremely cobbly loam, 50 to 75 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—15 percent

*Contrasting inclusions:*

- Inclusion 1: Graley extremely gravelly loam, 30 to 50



percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—5 percent

• Inclusion 2: Aridic Argixerolls, 15 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—5 percent

• Inclusion 3: Aridic Argixerolls, 15 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—5 percent

### **Characteristics of the Quarz Soil**

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—shale and sandstone

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Antelope bitterbrush, mountain big sagebrush, bluebunch wheatgrass, Idaho fescue

### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 30 percent cobbles and stones and 10 to 20 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

7 to 26 inches—very gravelly clay, very gravelly clay loam; 0 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.2 to 2.7 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Linrose Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—chert, shale and quartzite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, snowberry, mountain brome

### **Typical Profile**

0 to 8 inches—very cobbly loam; 30 to 45 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4

8 to 26 inches—very gravelly loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.2 to 3.4 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Cleavage Soil**

*Position on landscape:* Crests, shoulders, and upper side slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Idaho fescue, bluegrass

### **Typical Profile**

0 to 4 inches—extremely cobbly loam; 45 to 55 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—GM-GC, GC; estimated AASHTO classification—A-2

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 25 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave upper side slopes of mountains

*Contrasting features:* Bedrock within a depth of 20 inches, very gravelly clay subsoil

#### Inclusion 2

*Position on landscape:* Convex areas on south- and west-facing side slopes of mountains

*Contrasting features:* Very deep soil that has a very clayey subsoil

*Distinctive present vegetation:* Low sagebrush

#### Inclusion 3

*Position on landscape:* Concave snow pockets on north- and east-facing side slopes of mountains

*Contrasting features:* Additional moisture from drifted snow

*Distinctive present vegetation:* Serviceberry, Idaho fescue

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Quarz soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Linrose soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Quarz Soil for Selected Uses

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, too clayey, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—thin layer, large stones

### Ratings of the Linrose Soil for Selected Uses

*Range seeding:* Poor—droughty, large stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Cleavage Soil for Selected Uses

*Range seeding:* Poor—large stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

### Interpretive Groups

*Capability classification:* Quarz soil—VIIIs, nonirrigated; Linrose soil—VIIIs, nonirrigated; Cleavage soil—VIIIs, nonirrigated

*Range site:* Quarz soil—025X009N; Linrose soil—024X042N; Cleavage soil—025X024N

**830—Reese silt loam****Map Unit Setting**

*Position on landscape:* Basin floor

*Elevation:* 4,400 to 4,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Reese silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Argenta very fine sandy loam, 0 to 2 percent slopes—Aeric Halaquepts, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 2: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

**Characteristics of the Reese Soil**

*Position on landscape:* Flood plains

*Parent material:* Loamy mixed alluvium high in pyroclastics

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, shadscale, basin wildrye, spiny horsebrush, inland saltgrass

**Typical Profile**

0 to 9 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

9 to 60 inches or more—stratified silt loam to silty clay loam; massive; hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

**Soil and Water Features**

*Depth to seasonal high water table:* March through July—18 to 36 inches; rest of year—below 36 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—April through May

*Permeability:* Slow

*Available water capacity:* 9.2 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Concave alluvial flats

*Contrasting features:* Sandy loam throughout the profile  
*Distinctive present vegetation:* Black greasewood, inland saltgrass

**Inclusion 2**

*Position on landscape:* Alluvial flat remnants

*Contrasting features:* Moderately well drained  
*Distinctive present vegetation:* Iodinebush, alkali sacaton

**Inclusion 3**

*Position on landscape:* Convex alluvial flats

*Contrasting features:* Silty throughout the profile  
*Distinctive present vegetation:* Black greasewood, basin wildrye

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture

**Potential uses:** Rangeland, wildlife habitat, irrigated native pasture, homesites

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—good

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess sodium

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—flooding, frost action

*Roadfill:* Fair—low strength, shrink-swell, wetness

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess sodium, excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—wetness, excess sodium, excess salt

*Drainage:* Percs slowly, flooding, frost action

*Irrigation:* Wetness, percs slowly, erodes easily

*Terraces and diversions:* Erodes easily, wetness, percs slowly

### ***Interpretive Groups***

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X011N

## **835—Reese-Ocala association**

### ***Map Unit Setting***

*Position on landscape:* Basin floor

*Elevation:* 4,600 to 4,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### ***Composition***

*Major components:*

- Reese silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—45 percent

- Ocala silt loam, strongly saline-sodic, 0 to 2 percent slopes, rarely flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—9 percent

- Inclusion 2: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 3: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—1 percent

### ***Characteristics of the Reese Soil***

*Position on landscape:* Flood plains near river channels

*Parent material:* Kind—loamy alluvium high in pyroclastics; source—volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, seepweed, pickleweed, saltbush

### ***Typical Profile***

0 to 9 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

9 to 60 inches or more—stratified silt loam to silty clay loam; massive; hard, friable; strongly alkaline (pH

9.0); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### ***Soil and Water Features***

*Depth to seasonal high water table:* March through July—18 to 36 inches; rest of year—below 36 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—April through May

*Permeability:* Slow

*Available water capacity:* 9.2 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### ***Characteristics of the Ocala Soil***

*Position on landscape:* Outer margins of flood plains and alluvial flats

*Parent material:* Silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, basin wildrye

### ***Typical Profile***

0 to 6 inches—silt loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-4

6 to 13 inches—silt loam, silty clay loam; massive; hard, friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

13 to 60 inches or more—silt loam, silty clay loam; massive; hard, friable and brittle; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### ***Soil and Water Features***

*Depth to seasonal high water table:* March through May—42 to 60 inches; rest of year—below 60 inches

*Frequency of flooding:* Rare  
*Permeability:* Slow  
*Available water capacity:* 11.4 to 17.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth stream terraces  
*Contrasting features:* Moderately well drained  
*Distinctive present vegetation:* Black greasewood

#### **Inclusion 2**

*Position on landscape:* Smooth alluvial flats  
*Contrasting features:* Frequently flooded  
*Distinctive present vegetation:* Black greasewood, basin wildrye

#### **Inclusion 3**

*Position on landscape:* Smooth alluvial flat remnants  
*Contrasting features:* Moderately well drained  
*Distinctive present vegetation:* Black greasewood, shadscale

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Reese soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

*Suitability of the Ocala soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

#### **Ratings of the Reese Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium  
*Daily cover for landfill:* Poor—excess sodium  
*Shallow excavations:* Severe—wetness  
*Local roads and streets:* Severe—flooding, frost action  
*Roadfill:* Poor—low strength, shrink-swell, wetness  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess sodium, excess salt  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—wetness, excess sodium, wetness

#### **Ratings of the Ocala Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium  
*Daily cover for landfill:* Poor—excess sodium  
*Shallow excavations:* Moderate—wetness  
*Local roads and streets:* Severe—low strength, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt, excess sodium  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Interpretive Groups**

*Capability classification:* Reese soil—VIIw, nonirrigated; Ocala soil—VIIw, nonirrigated  
*Range site:* Reese soil—024X011N; Ocala soil—024X011N

## **841—Wendane Variant silt loam**

### **Map Unit Setting**

*Position on landscape:* Basin floor remnants  
*Elevation:* 5,600 to 5,700 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 47 degrees F  
*Frost-free season:* About 100 days

### **Composition**

#### **Major components:**

• Wendane Variant silt loam, 0 to 2 percent slopes—Aeric Halaquepts, loamy-skeletal, mixed (calcareous), mesic—95 percent

#### **Contrasting inclusions:**

• Inclusion 1: Whirlo very gravelly loam, 0 to 2 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—5 percent

### **Characteristics of the Wendane Variant Soil**

*Position on landscape:* Basin floor remnants  
*Parent material:* Loess, volcanic ash, and mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Alkali muhly, alkali sacaton, Indian ricegrass, alkali cordgrass

### **Typical Profile**

0 to 10 inches—silt loam; subangular blocky structure; hard, friable; strongly alkaline (pH 9.0); strongly saline (30 to 50 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

10 to 18 inches—gravelly silt loam; 30 to 50 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL-ML, CL, GM-GC, GC; estimated AASHTO classification—A-2, A-4, A-6

18 to 60 inches or more—very gravelly loam; 50 to 65 percent pebbles (by weight); massive; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* February through June—18 to 30 inches; rest of year—below 30 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 6.7 to 7.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Alluvial fans adjacent to basin floors

*Contrasting features:* Well drained

*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture

**Potential uses:** Rangeland, wildlife habitat, irrigated pasture and hayland

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants

(nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones, excess sodium

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—frost action

*Roadfill:* Fair—wetness, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—wetness, excess salt, excess sodium

*Drainage:* Frost action, excess salt

*Irrigation:* Wetness, excess salt, erodes easily

*Terraces and diversions:* Erodes easily, wetness

### Interpretive Groups

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X009N

## 850—Relley silt loam

### Map Unit Setting

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Antel silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent

- Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—4 percent

- Inclusion 3: Bubus very fine sandy loam—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent

- Inclusion 4: Wholan very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—3 percent

### Characteristics of the Relley Soil

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, cheatgrass

## Typical Profile

- 0 to 8 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
- 8 to 16 inches—silt loam; 0 to 5 percent pebbles (by weight); prismatic structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
- 16 to 28 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
- 28 to 63 inches or more—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

## Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 10.8 to 12.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

## Contrasting Inclusions

### Inclusion 1

*Position on landscape:* Slightly concave areas of fan skirts  
*Contrasting features:* Moderately well drained  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Inclusion 2

*Position on landscape:* Concave alluvial flat remnants adjacent to fan skirts  
*Contrasting features:* Calcareous and moderately saline-sodic throughout the profile

*Distinctive present vegetation:* Shadscale, black greasewood

### Inclusion 3

*Position on landscape:* Concave alluvial flat remnants adjacent to fan skirts  
*Contrasting features:* Calcareous and loamy throughout the profile  
*Distinctive present vegetation:* Shadscale, black greasewood

### Inclusion 4

*Position on landscape:* Adjacent slightly concave inset fans  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Winterfat

## Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

## Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

## Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—low strength, shrink-swell  
*Roadfill:* Fair—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—thin layer  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

## Interpretative Groups

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated  
*Range site:* 024X002N

## 851—Relley silt loam, cemented substratum

### Map Unit Setting

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Relley silt loam, cemented substratum, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Antel silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—10 percent
- Inclusion 2: Raglan silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—5 percent

### **Characteristics of the Relley Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Indian ricegrass

### **Typical Profile**

0 to 8 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

8 to 16 inches—silt loam; 0 to 5 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

16 to 28 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

28 to 50 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

50 to 60 inches or more—strongly cemented duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 10.8 to 12.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—3; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave areas of fan skirts

*Contrasting features:* Very deep soil, lacks a duripan

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Adjacent slightly concave inset fans

*Contrasting features:* Calcareous throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Fair—thin layer, cemented pan

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Fair—low strength, shrink-swell, thin layer

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer

*Pond reservoir areas:* Moderate—seepage, cemented pan

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water



*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated  
*Range site:* 024X002N

## **852—Relley silt loam, strongly saline**

### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,600 to 5,500 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Relley silt loam, strongly saline, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Antel silt loam, moderately saline, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent
- Inclusion 2: Wholan very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—5 percent

### **Characteristics of the Relley Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—long; shape—slightly convex to slightly concave  
*Dominant present vegetation:* Shadscale, black greasewood, bud sagebrush

### **Typical Profile**

- 0 to 8 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
- 8 to 16 inches—silt loam; 0 to 5 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
- 16 to 28 inches—silt loam; 0 to 5 percent pebbles (by

weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

28 to 60 inches or more—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 10.8 to 12.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly concave areas on fan skirts

*Contrasting features:* Moderately well drained, moderately saline

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Adjacent smooth inset fans

*Contrasting features:* Silt loam throughout the profile, nonsaline

*Distinctive present vegetation:* Winterfat, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland

### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—low strength, shrink-swell  
*Roadfill:* Fair—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* VIs, irrigated, and VIIs, nonirrigated  
*Range site:* 024X003

## **853—Relley silty clay loam**

### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,600 to 5,600 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*  
 • Relley silty clay loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—90 percent  
*Contrasting inclusions:*  
 • Inclusion 1: Antel silty clay loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—10 percent

### **Characteristics of the Relley Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—long; shape—smooth to slightly convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—silty clay loam; 0 to 5 percent pebbles

(by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); strongly saline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-6, A-7

8 to 16 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

16 to 28 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

28 to 60 inches or more—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 10.8 to 12.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly concave areas of fan skirts  
*Contrasting features:* Moderately well drained  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor;  
wetland plants—poor; shallow water areas—very  
poor

### **Ratings and Restrictive Features of the Relley Soil for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Fair—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

## **855—Relley-Broyles association**

### **Map Unit Setting**

*Position on landscape:* Piedmont slopes

*Elevation:* 4,500 to 5,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—60 percent
- Broyles very fine sandy loam, 0 to 2 percent slopes, frequently flooded—Duric Camborthids, coarse-loamy, mixed, mesic—30 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—8 percent
- Inclusion 2: Entic Durorthids, 0 to 2 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—1 percent
- Inclusion 3: Typic Torriorthents, 0 to 4 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—1 percent

### **Characteristics of the Relley Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, horsebrush, spiny hopsage, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

8 to 16 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

16 to 28 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

28 to 60 inches or more—silt loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 10.8 to 12.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of the Broyles Soil**

*Position on landscape:* Inset fans

*Parent material:* Loess capped, loamy, volcanic alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, winterfat, bud sagebrush

### Typical Profile

- 0 to 5 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
- 5 to 14 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
- 14 to 60 inches or more—gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—frequent; duration—very brief; months—December through May  
*Permeability:* Moderately rapid  
*Available water capacity:* 5.9 to 7.7 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Alluvial flat remnants adjacent to lower margins of fan skirts  
*Contrasting features:* Calcareous throughout the profile  
*Distinctive present vegetation:* Shadscale, black greasewood

#### Inclusion 2

*Position on landscape:* Nonburied fan piedmont remnants

*Contrasting features:* Strongly cemented duripan at a depth of 10 to 20 inches

*Distinctive present vegetation:* Shadscale

#### Inclusion 3

*Position on landscape:* Adjacent to channels

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland

#### Wildlife habitat elements:

*Suitability of the Relley soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Broyles soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### Ratings and Restrictive Features of the Relley Soil for Selected Uses and Practices

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Fair—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

### Ratings and Restrictive Features of the Broyles Soil for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Fair—small stones

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Relley soil—IIc, irrigated, and VIIc, nonirrigated; Broyles soil—IIIw, irrigated, and VIIw, nonirrigated

*Range site:* Relley soil—024X002N; Broyles soil—024X014N

## 861—Rixie silty clay loam, strongly saline

### Map Unit Setting

*Position on landscape:* Basin floors

*Elevation:* 4,500 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Rixie silty clay loam, strongly saline, 0 to 2 percent slopes—Aquic Duric Haploxerolls, fine-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Prida silt loam, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Sonoma silt loam, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

### Characteristics of the Rixie Soil

*Position on landscape:* Flood plains

*Parent material:* Kind—alluvium influenced by volcanic ash; source—volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Inland saltgrass, alkali sacaton, seepweed

### Typical Profile

0 to 10 inches—silty clay loam; subangular blocky structure; hard, friable; strongly alkaline (pH 8.8); strongly saline (20 to 40 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, ML; estimated AASHTO classification—A-7

10 to 60 inches or more—stratified silt loam to silty clay; massive; hard, firm; strongly alkaline (pH 8.6); strongly saline (16 to 25 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* February through July—24 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* Slow

*Available water capacity:* 10.2 to 11.4 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Alluvial flats adjacent to flood plains

*Contrasting features:* Rarely flooded

*Distinctive present vegetation:* Iodinebush, alkali sacaton

#### Inclusion 2

*Position on landscape:* Outer margins of flood plains

*Contrasting features:* Poorly drained

*Distinctive present vegetation:* Alkali sacaton, alkali cordgrass

#### Inclusion 3

*Position on landscape:* Alluvial flats

*Contrasting features:* Strongly sodium-affected surface layer

*Distinctive present vegetation:* Black greasewood, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—excess salt

*Daily cover for landfill:* Poor—excess salt, too clayey

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Percs slowly, flooding, frost action

*Irrigation:* Wetness, percs slowly, erodes easily

*Terraces and diversions:* Erodes easily, wetness, percs slowly

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X009N

## **862—Rixie silty clay loam, drained, strongly saline**

### **Map Unit Setting**

*Position on landscape:* Basin floors

*Elevation:* 4,400 to 4,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Rixie silty clay loam, drained, strongly saline, 0 to 2 percent slopes—Aquic Duric Haploxerolls, fine-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Argenta very fine sandy loam, 0 to 2 percent slopes—Aeric Halaquepts, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 2: Parana silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—4 percent
- Inclusion 3: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 4: Rose Creek silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—3 percent

### **Characteristics of the Rixie Soil**

*Position on landscape:* Flood plains with entrenched channels

*Parent material:* Kind—alluvium influenced by volcanic ash; source—volcanic rock

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, basin wildrye, shadscale, inland saltgrass

### **Typical Profile**

0 to 10 inches—silty clay loam; subangular blocky structure; hard, friable; strongly alkaline (pH 8.8);

strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL; estimated AASHTO classification—A-7, A-6

10 to 60 inches or more—stratified silt loam to silty clay; massive; hard, firm; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through July—48 to 72 inches; rest of year—below 72 inches

*Frequency of flooding:* Rare

*Permeability:* Slow

*Available water capacity:* 10.2 to 11.4 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Alluvial flat remnants

*Contrasting features:* Fine sandy loam substratum

*Distinctive present vegetation:* Black greasewood

#### **Inclusion 2**

*Position on landscape:* Lowest areas on flood plains

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Sedge, alkali cordgrass

#### **Inclusion 3**

*Position on landscape:* Alluvial flats adjacent to flood plains

*Contrasting features:* Fine-silty throughout the profile; thin, light colored surface layer

*Distinctive present vegetation:* Alkali sacaton, basin wildrye

#### **Inclusion 4**

*Position on landscape:* Areas adjacent to stream channels

*Contrasting features:* Frequently flooded, sandy loam substratum

*Distinctive present vegetation:* Sedge, creeping wildrye

#### **Other inclusions of minor extent**

*Position on landscape:* Lower areas on flood plains

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Alkali sacaton, alkali bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—good

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium  
*Daily cover for landfill:* Poor—excess salt, too clayey  
*Shallow excavations:* Moderate—wetness, too clayey  
*Local roads and streets:* Severe—low strength, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt, too clayey  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—excess salt  
*Drainage:* Percs slowly, flooding, frost action  
*Irrigation:* Wetness, percs slowly, erodes easily  
*Terraces and diversions:* Erodes easily, percs slowly

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated  
*Range site:* 024X007N

## **863—Rixie-Rixie, sodic, complex**

### **Map Unit Setting**

*Position on landscape:* Flood plains  
*Elevation:* 4,400 to 4,800 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Rixie silty clay loam, 0 to 2 percent slopes—Aquic Durorthidic Haploxerolls, fine-loamy, mixed, mesic—50 percent
- Rixie silt loam, sodic, 0 to 2 percent slopes—Aquic Durorthidic Haploxerolls, fine-loamy, mixed, mesic—40 percent

#### **Contrasting inclusions:**

- Inclusion 1: Prida silt loam, 0 to 2 percent slopes—Aquic Durothidic Torriorthents, fine-silty, mixed (calcareous), mesic—10 percent

### **Characteristics of the Rixie Soil**

*Position on landscape:* Low-lying areas on flood plains

*Parent material:* Kind—alluvium; source—dominantly volcanic rock

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Inland saltgrass, iodinebush

### **Typical Profile**

0 to 10 inches—silty clay loam; subangular blocky structure; hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, CM; estimated AASHTO classification—A-7

10 to 60 inches or more—stratified silt loam to silty clay; massive; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through July—24 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* Slow

*Available water capacity:* 10.2 to 11.4 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* High

### **Characteristics of the Rixie, Sodic, Soil**

*Position on landscape:* Undulating mounds on flood plains

*Parent material:* Kind—alluvium; source—dominantly volcanic rock

*Slope features:* Length—short; slightly concave to slightly convex

*Dominant present vegetation:* Alkali sacaton, inland saltgrass, iodinebush

**Typical Profile**

0 to 15 inches—silt loam; subangular blocky structure; hard, friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL; estimated AASHTO classification—A-6

15 to 60 inches or more—stratified silt loam to silty clay; massive; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

**Soil and Water Features**

*Depth to seasonal high water table:* February through July—24 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* Slow

*Available water capacity:* 10.2 to 11.4 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Alluvial flats adjacent to flood plains

*Contrasting features:* Rarely flooded

*Distinctive present vegetation:* Iodinebush, alkali sacaton

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

**Wildlife habitat elements:**

*Suitability of the Rixie soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—fair; shallow water areas—good

*Suitability of the Rixie, sodic, soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs

(nonirrigated)—very poor; wetland plants—poor; shallow water areas—good

**Ratings and Restrictive Features of the Rixie Soil for Selected Uses and Practices**

*Range seeding:* Poor—excess salt

*Daily cover for landfill:* Poor—excess salt, too clayey

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Percs slowly, flooding, frost action

*Irrigation:* Wetness, percs slowly, erodes easily

*Terraces and diversions:* Erodes easily, wetness, percs slowly

**Ratings and Restrictive Features of the Rixie, Sodic, Soil for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, too clayey

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Percs slowly, flooding, frost action

*Irrigation:* Wetness, percs slowly, erodes easily

*Terraces and diversions:* Erodes easily, wetness, percs slowly

**Interpretive Groups**

*Capability classification:* Rixie soil—IIIw, irrigated, and VIIw, nonirrigated; Rixie, sodic, soil—VIw, irrigated, and VIIw, nonirrigated

*Range site:* Rixie soil—024X009N; Rixie, sodic, soil—024X010N

**864—Rixie silty clay loam****Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,400 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days



### Composition

#### Major components:

- Rixie silty clay loam, 0 to 2 percent slopes—Aquic Duric Haploxerolls, fine-loamy, mixed, mesic—85 percent

#### Contrasting inclusions:

- Inclusion 1: Parana silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Rose Creek silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

### Characteristics of the Rixie Soil

*Position on landscape:* Flood plains

*Parent material:* Kind—alluvium influenced by volcanic ash; source—dominantly volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Spikerush, sedge, bluegrass, creeping wildrye, inland saltgrass

### Typical Profile

- 0 to 10 inches—silty clay loam; angular blocky structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL, ML; estimated AASHTO classification—A-7
- 10 to 43 inches—stratified silt loam to silty clay; massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7
- 43 to 60 inches or more—stratified very gravelly sand to fine sandy loam; 35 to 60 percent pebbles (by weight); massive and single grained; slightly hard, friable and loose; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to seasonal high water table:* February through July—24 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* In the upper 43 inches—slow; below this depth—moderately rapid

*Available water capacity:* 8.0 to 9.5 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Lower parts of flood plains

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Creeping wildrye

#### Inclusion 2

*Position on landscape:* Slightly convex natural levees along channels

*Contrasting features:* Sandy loam profile

*Distinctive present vegetation:* Creeping wildrye

#### Inclusion 3

*Position on landscape:* Alluvial flats adjacent to channels

*Contrasting features:* Strongly salt and sodium affected

*Distinctive present vegetation:* Black greasewood, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Fair—excess salt

*Daily cover for landfill:* Poor—too clayey

*Shallow excavations:* Severe—wetness, cutbanks cave

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Fair—wetness

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Moderate—thin layer, piping, wetness

*Drainage:* Percs slowly, flooding, frost action

*Irrigation:* Wetness, perc slowly, erodes easily

*Terraces and diversions:* Erodes easily, wetness, perc slowly

### ***Interpretive Groups***

*Capability classification:* Ilw, irrigated, and Vlw, nonirrigated

*Range site:* 025X001N

## **870—Roca-Bregar-Linrose association**

### ***Map Unit Setting***

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,500 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 90 days

### ***Composition***

*Major components:*

- Roca very cobbly loam, 50 to 75 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—35 percent
- Bregar gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—25 percent
- Linrose gravelly loam, 50 to 75 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—25 percent

*Contrasting inclusions:*

- Inclusion 1: Rubble land—6 percent
- Inclusion 2: Aridic Argixerolls, 50 to 75 percent slopes—5 percent
- Inclusion 3: Rock outcrop—3 percent
- Inclusion 4: Cumulic Haplaquolls, 2 to 8 percent slopes—Cumulic Haplaquolls, loamy-skeletal, mixed, frigid—1 percent

### ***Characteristics of the Roca Soil***

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—cherts and shales

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Bluebunch wheatgrass, big sagebrush, Thurber needlegrass

### ***Typical Profile***

0 to 5 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 27 inches—very gravelly clay loam, very gravelly

clay; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

27 inches—unweathered bedrock

### ***Soil and Water Features***

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### ***Characteristics of the Bregar Soil***

*Position on landscape:* Crests of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Idaho fescue, low sagebrush, black sagebrush

### ***Typical Profile***

0 to 4 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; slightly acid (pH 6.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

4 to 11 inches—very gravelly clay loam, extremely gravelly loam, very cobbly sandy clay loam; 0 to 40 percent cobbles and stones and 65 to 80 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

11 inches—unweathered bedrock

### ***Soil and Water Features***

*Depth to bedrock:* 5 to 12 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Medium

*Available water capacity:* 1.0 to 1.3 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Linrose Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—shale, chert, and quartzite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, Idaho fescue, bluegrass

### **Typical Profile**

0 to 8 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, ML; estimated AASHTO classification—A-4

8 to 26 inches—very gravelly loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.2 to 3.4 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Rock screes on side slopes of mountains

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Concave, north-facing side slopes of mountains

*Contrasting features:* Deep to bedrock

*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush

#### **Inclusion 3**

*Position on landscape:* Rimrock and scattered peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 4**

*Position on landscape:* Narrow perennial drainageways of mountains

*Contrasting features:* Thick, dark colored surface layer, receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Roca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Bregar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Linrose soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Roca Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Bregar Soil for Selected Uses**

*Range seeding:* Poor—droughty, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Linrose Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Roca soil—VIIIs, nonirrigated; Bregar soil—VIIIs, nonirrigated; Linrose soil—VIIe, nonirrigated

*Range site:* Roca soil—024X028N; Bregar soil—024X016N; Linrose soil—024X042N

### **872—Roca-Linrose-Wiskan association**

#### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 8,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 90 days

#### **Composition**

*Major components:*

- Roca very gravelly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—35 percent
- Linrose very gravelly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—30 percent
- Wiskan very gravelly loam, 30 to 50 percent slopes—

Xerollic Haplargids, loamy-skeletal, mixed, frigid—25 percent

*Contrasting inclusions:*

- Inclusion 1: Glean gravelly silt loam, 30 to 50 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—6 percent

- Inclusion 2: Bucan gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—2 percent

- Inclusion 3: Bregar extremely gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—2 percent

#### **Characteristics of the Roca Soil**

*Position on landscape:* South-facing, upper and mid side slopes of mountains

*Parent material:* Kind—residuum; source—chert and shale

*Slope features:* Length—long; shape—smooth to convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

*Surface cover:* 45 percent pebbles

#### **Typical Profile**

0 to 5 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

5 to 27 inches—very gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

27 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Linrose Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—shales, cherts, and quartzite

*Dominant present vegetation:* Black sagebrush, Idaho fescue, bluegrass

### **Typical Profile**

0 to 8 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-4, A-1

8 to 26 inches—very gravelly loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.2 to 3.4 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Wiskan Soil**

*Position on landscape:* East- and west-facing side slopes of mountains

*Parent material:* Kind—thin loess mantle over colluvium and residuum; source—chert and other various kinds of rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, Sandberg bluegrass, Douglas rabbitbrush

### **Typical Profile**

0 to 16 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); granular; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

16 to 28 inches—very gravelly clay loam, very gravelly loam, extremely gravelly clay loam; 10 to 25 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

28 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.4 to 3.0 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave, north-facing back slopes of mountains

*Contrasting features:* Receives additional soil moisture from drifted snow

*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush, snowberry

#### **Inclusion 2**

*Position on landscape:* South-facing foot slopes of mountains

*Contrasting features:* Clay subsoil

*Distinctive present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

#### **Inclusion 3**

*Position on landscape:* Crests of mountains

*Contrasting features:* Bedrock within a depth of 20 inches

*Distinctive present vegetation:* Black sagebrush, low sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Roca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Linrose soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Wiskan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Roca Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Linrose Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Wiskan Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Roca soil—VIIIs, nonirrigated; Linrose soil—VIIIs, nonirrigated; Wiskan soil—VIIIs, nonirrigated

*Range site:* Roca soil—024X028N; Linrose soil—024X042N; Wiskan soil—024X031N

## **873—Roca-Reluctan association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,400 to 7,400 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Roca very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—50 percent
  - Reluctan very cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—35 percent
- Contrasting inclusions:*
- Inclusion 1: Xerollic Haplargids, 15 to 30 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—6 percent
  - Inclusion 2: Rock outcrop—4 percent
  - Inclusion 3: Welch clay loam, drained, 4 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—3 percent
  - Inclusion 4: Rubble land—2 percent

### **Characteristics of the Roca Soil**

*Position on landscape:* Predominantly south- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—chert and shale

*Slope features:* Length—long; shape—smooth to concave

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Thurber needlegrass, basin wildrye

### **Typical Profile**

0 to 5 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 27 inches—very gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

27 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Characteristics of the Reluctant Soil

*Position on landscape:* Predominantly north- and east-facing side slopes of mountains

*Parent material:* Kind—loamy residuum and colluvium; source—rhyolitic rocks

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, Thurber needlegrass

### Typical Profile

0 to 13 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 40 to 55 percent pebbles (by weight); platy; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4, A-2

13 to 38 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

38 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.0 to 5.2 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Predominately north- and east-facing, concave foot slopes of mountains

*Contrasting features:* Deep to bedrock and has a clayey subsoil

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Shoulder slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### Inclusion 3

*Position on landscape:* Concave, narrow drainageways of mountains

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Roca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Reluctant soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Roca Soil for Selected Uses

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Reluctant Soil for Selected Uses**

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—piping, large stones

#### **Interpretive Groups**

*Capability classification:* Roca soil—VIIIs, nonirrigated;  
 Reluctant soil—VIIIs, nonirrigated

*Range site:* Roca soil—024X028N; Reluctant soil—024X021N

### **875—Roca-Glean-Bregar association**

#### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,400 to 7,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 80 days

#### **Composition**

*Major components:*

- Roca very cobbly loam, 30 to 75 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—40 percent
- Glean gravelly silt loam, 30 to 75 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—25 percent
- Bregar extremely gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—20 percent

*Contrasting inclusions:*

- Inclusion 1: Aridic Argixerolls, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—7 percent
- Inclusion 2: Lithic Haplargids, 30 to 50 percent slopes—Lithic Haplargids, loamy-skeletal, mixed, mesic—6 percent
- Inclusion 3: Rock outcrop—2 percent

#### **Characteristics of the Roca Soil**

*Position on landscape:* South-, west-, and east-facing side slopes of mountains

*Parent material:* Kind—residuum; source—chert and shale

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Bluebunch wheatgrass, mountain big sagebrush, Thurber needlegrass

#### **Typical Profile**

0 to 5 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 27 inches—very gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

27 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### **Characteristics of the Glean Soil**

*Position on landscape:* North-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—various kinds of rock

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Mountain big sagebrush, Idaho fescue, bluegrass

#### **Typical Profile**

0 to 6 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2);



estimated Unified classification—SM, GM, ML;  
estimated AASHTO classification—A-4

6 to 49 inches—very gravelly loam, very gravelly sandy loam; 0 to 25 percent cobbles and stones and 40 to 75 percent pebbles (by weight); massive; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
49 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 40 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.1 to 5.0 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Very rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—3; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Bregar Soil

*Position on landscape:* Crests and shoulder slopes of mountains  
*Parent material:* Kind—residuum; source—volcanic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, bluegrass, black sagebrush

### Typical Profile

0 to 4 inches—extremely gravelly loam; 10 to 20 percent cobbles and stones and 70 to 80 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2  
4 to 11 inches—very gravelly clay loam, very cobbly sandy clay loam, extremely gravelly sandy clay loam; 5 to 45 percent cobbles and stones and 65 to 75 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
11 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 5 to 12 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.0 to 1.3 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Irregular to slightly concave, south-facing side slopes of mountains  
*Contrasting features:* Thick, dark colored surface layer and a layer of clay accumulation  
*Distinctive present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

#### Inclusion 2

*Position on landscape:* Convex, north-facing shoulder slopes of mountains  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Steep, eroded side slopes and rimrock along south-facing shoulder slopes of mountains  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Roca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Glean soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Bregar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Roca Soil for Selected Uses

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Glean Soil for Selected Uses**

*Range seeding:* Fair—droughty, small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope, seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Bregar Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Roca soil—VIIIs, nonirrigated; Glean soil—VIIe, nonirrigated; Bregar soil—VIIIs, nonirrigated

*Range site:* Roca soil—024X028N; Glean soil—024X023N; Bregar soil—024X016N

### **881—Rose Creek silt loam, drained, strongly saline**

#### **Map Unit Setting**

*Position on landscape:* Stream terraces

*Elevation:* 4,400 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

##### *Major components:*

- Rose Creek silt loam, drained, strongly saline, 0 to 2 percent slopes—Fluvaquent Haploxerolls, coarse-loamy, mixed, mesic—85 percent

##### *Contrasting inclusions:*

- Inclusion 1: Rixie silty clay loam, drained, strongly saline, 0 to 2 percent slopes—Aquic Duric Haploxerolls, fine-loamy, mixed, mesic—5 percent
- Inclusion 2: Sonoma silty clay loam, drained, strongly saline, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

#### **Characteristics of the Rose Creek Soil**

*Position on landscape:* Stream terraces

*Parent material:* Kind—colluvium; source—dominantly from volcanic rock

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, seepweed, inland saltgrass

#### **Typical Profile**

- 0 to 10 inches—silt loam; platy structure; hard, firm; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 10 to 60 inches or more—stratified very fine sandy loam to gravelly sand; 5 to 15 percent cobbles and stones and pebbles (by weight); platy structure; hard, firm; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* February through May—48 to 72 inches; rest of year—below 72 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly lower areas on stream terraces

*Contrasting features:* Stratified fine sandy loam to silty clay

*Distinctive present vegetation:* Black greasewood, inland saltgrass

#### **Inclusion 2**

*Position on landscape:* Small irregularly shaped areas on the outer margin of stream terraces

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Black greasewood, basin wildrye

#### **Inclusion 3**

*Position on landscape:* Alluvial flats along the margin of stream terraces

*Contrasting features:* Strongly sodium-affected surface layer

*Distinctive present vegetation:* Black greasewood, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—too sandy, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily, too sandy

### **Interpretive Groups**

*Capability classification:* VIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X007N

## **882—Rose Creek silty clay loam**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,400 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Rose Creek silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Humboldt silty clay loam, moderately saline, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcareous), mesic—5 percent
- Inclusion 2: Parana silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 3: Sonoma silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—2 percent

### **Characteristics of the Rose Creek Soil**

*Position on landscape:* Flood plains adjacent to stream channels

*Parent material:* Kind—alluvium; source—dominantly volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Willow, spikerush, sedge, rush, creeping wildrye, inland saltgrass

### **Typical Profile**

0 to 10 inches—silty clay loam; platy structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

10 to 60 inches or more—stratified silt loam to gravelly sand; 5 to 30 percent cobbles and stones and pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4, A-2

### Soil and Water Features

*Depth to seasonal high water table:* February through June—18 to 36 inches; rest of year—below 36 inches  
*Flooding:* Frequency—frequent; duration—brief or long; months—December through June  
*Permeability:* Moderately rapid  
*Available water capacity:* 8.4 to 9.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Small, irregularly shaped depressional areas of flood plains  
*Contrasting features:* Clayey throughout the profile  
*Distinctive present vegetation:* Sedge

#### Inclusion 2

*Position on landscape:* Small, irregularly shaped slightly lower areas of flood plains  
*Contrasting features:* Silt loam throughout the profile  
*Distinctive present vegetation:* Sedge

#### Inclusion 3

*Position on landscape:* Along the outer margin of flood plains  
*Contrasting features:* Silt loam throughout the profile; a thin, light colored surface layer  
*Distinctive present vegetation:* Sedge

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Fair—excess salt  
*Daily cover for landfill:* Poor—too sandy  
*Shallow excavations:* Severe—cutbanks cave, wetness  
*Local roads and streets:* Severe—frost action, flooding  
*Roadfill:* Fair—wetness  
*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Topsoil:* Too sandy  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—piping, wetness  
*Drainage:* Flooding, frost action, cutbanks cave  
*Irrigation:* Wetness, erodes easily, flooding  
*Terraces and diversions:* Erodes easily, wetness, too sandy

### Interpretive Groups

*Capability classification:* IIIw, irrigated, and Vw, nonirrigated  
*Range site:* 025X001N

## 883—Rose Creek-Paranat silty clay loams

### Map Unit Setting

*Position on landscape:* Flood plains  
*Elevation:* 4,400 to 4,800 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### Composition

#### Major components:

- Rose Creek silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—55 percent
  - Paranat silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—35 percent
- Contrasting inclusions:*
- Inclusion 1: Humboldt silty clay loam, moderately saline, 0 to 2 percent slopes—(Fluvaquentic Haplaquolls, fine, montmorillonitic (calcareous), mesic—5 percent
  - Inclusion 2: Sonoma silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

### Characteristics of the Rose Creek Soil

*Position on landscape:* Adjacent to channels on flood plains  
*Parent material:* Kind—alluvium; source—dominantly volcanic rock  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Willow, spikerush, sedge, rush, creeping wildrye, saltgrass

### Typical Profile

0 to 10 inches—silty clay loam; platy structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated

Unified classification—CL; estimated AASHTO classification—A-6, A-7

10 to 60 inches or more—stratified silt loam to gravelly sand; 5 to 30 percent cobbles and stones and pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4, A-2

### Soil and Water Features

*Depth to seasonal high water table:* February through June—18 to 36 inches; rest of year—below 36 inches

*Flooding:* Frequency—frequent; duration—brief or long; months—February through June

*Permeability:* Moderately rapid

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

### Characteristics of the Paranat Soil

*Position on landscape:* Depressional areas on flood plains

*Parent material:* Silty mixed alluvium influenced by loess

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Willow, spikerush, sedge, rush, creeping wildrye, inland saltgrass

### Typical Profile

0 to 20 inches—silty clay loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-6, A-7

20 to 48 inches—stratified silty clay loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-6, A-7

48 to 60 inches or more—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated

Unified classification—ML; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to seasonal high water table:* November through June—18 to 42 inches; rest of year—below 42 inches

*Flooding:* Frequency—frequent; duration—brief or long; months—December through June

*Permeability:* Moderately slow

*Available water capacity:* 11.5 to 13.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Backwater areas of flood plains

*Contrasting features:* Clayey throughout the profile

*Distinctive present vegetation:* Sedge

#### Inclusion 2

*Position on landscape:* Small irregularly shaped areas on the outer margin of flood plains

*Contrasting features:* Thin, light colored surface layer

*Distinctive present vegetation:* Sedge

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

### Wildlife habitat elements:

*Suitability of the Rose Creek soil for named elements:*

Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

*Suitability of the Paranat soil for named elements:* Grain

and seed crops (irrigated)—very poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

### Ratings and Restrictive Features of the Rose Creek Soil for Selected Uses and Practices

*Range seeding:* Fair—excess salt

*Daily cover for landfill:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave, wetness  
*Local roads and streets:* Severe—frost action, flooding  
*Roadfill:* Fair—wetness  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—too sandy  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—piping, wetness  
*Drainage:* Flooding, frost action, cutbanks cave  
*Irrigation:* Wetness, erodes easily, flooding  
*Terraces and diversions:* Erodes easily, wetness, too sandy

### **Ratings and Restrictive Features of the Paranat Soil for Selected Uses and Practices**

*Range seeding:* Fair—excess salt  
*Daily cover for landfill:* Fair—too clayey, wetness  
*Shallow excavations:* Severe—wetness  
*Local roads and streets:* Severe—low strength, flooding, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—too clayey  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—piping, wetness  
*Drainage:* Flooding, frost action  
*Irrigation:* Wetness, erodes easily, flooding  
*Terraces and diversions:* Erodes easily, wetness

### **Interpretive Groups**

*Capability classification:* Rose Creek soil—IIIw, irrigated, and Vw, nonirrigated; Paranat soil—Vw, irrigated, and Vw, nonirrigated  
*Range site:* Rose Creek soil—025X001N; Paranat soil—025X001N

## **891—Rosney loam, cemented substratum**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats  
*Elevation:* 4,500 to 4,800 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*  
 • Rosney loam, cemented substratum, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—90 percent

### **Contrasting inclusions:**

- Inclusion 1: Reese silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 3: Bubus very fine sand, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—2 percent

### **Characteristics of the Rosney Soil**

*Position on landscape:* Alluvial flat remnants  
*Parent material:* Loess capped mixed alluvium influenced by volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, shadscale, seepweed, basin wildrye, inland saltgrass

### **Typical Profile**

0 to 9 inches—loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4  
 9 to 50 inches—silty clay loam, silt loam; massive; slightly hard, friable; very strongly alkaline (pH 9.6); strongly saline (30 to 50 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
 50 to 60 inches or more—strongly cemented duripan

### **Soil and Water Features**

*Depth to hardpan:* 50 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 10.0 to 11.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—3; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Stream terraces adjacent to alluvial flats

*Contrasting features:* Somewhat poorly drained  
*Distinctive present vegetation:* Black greasewood

#### **Inclusion 2**

*Position on landscape:* Lower areas of alluvial flat remnants

*Contrasting features:* Moderately well drained  
*Distinctive present vegetation:* Shadscale, bud sagebrush, black greasewood

#### **Inclusion 3**

*Position on landscape:* Slightly higher areas of alluvial flat remnants

*Contrasting features:* Fine sandy loam throughout the profile

*Distinctive present vegetation:* Shadscale, black greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native hayland and pasture

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—cemented pan, thin layer

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—cemented pan

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Deep to water

*Irrigation:* Excess salt, excess sodium, erodes easily

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* VIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X003N

## **892—Rosney silt loam**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,500 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Rosney silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 2: Landco silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty over clayey, mixed (calcareous), mesic—5 percent

- Inclusion 3: Yipor silt loam, moderately saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Rosney Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Thin loess mantle capping silty mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, seepweed, saltbush, shadscale, inland saltgrass

### **Typical Profile**

0 to 7 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

7 to 25 inches—silt loam; massive; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 40 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL-ML, A-4; estimated AASHTO classification—A-4

25 to 60 inches or more—stratified silt loam to silty clay; massive; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (40 to 60 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 10.2 to 11.4 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.64; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower areas of alluvial flat remnants

*Contrasting features:* Moderately well drained  
*Distinctive present vegetation:* Shadscale, black greasewood, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Alluvial flats  
*Contrasting features:* Clayey substratum  
*Distinctive present vegetation:* Saltbush, alkali sacaton, black greasewood

#### **Inclusion 3**

*Position on landscape:* Lower margins of fan skirts adjacent to alluvial flats  
*Contrasting features:* Silt loam throughout the profile  
*Distinctive present vegetation:* Shadscale, black greasewood, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland, homesites

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt, excess sodium  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—excess salt, excess sodium  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess sodium, excess salt  
*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* VIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X012N

## **970—Soolake very fine sandy loam, 0 to 2 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 4,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Soolake very fine sandy loam, 0 to 2 percent slopes—Typic Torriorthents, sandy, mixed, mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 3: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—2 percent

### **Characteristics of the Soolake Soil**

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, black greasewood, bud sagebrush

### **Typical Profile**

0 to 13 inches—very fine sandy loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified



classification—ML; estimated AASHTO classification—A-4

- 13 to 22 inches—fine sandy loam, very fine sandy loam; massive; soft, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4
- 22 to 60 inches or more—stratified loamy fine sand to sand; 5 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 5.4 to 7.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity to steel:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper parts of fan skirts  
*Contrasting features:* Nonsaline surface layer, loamy throughout the profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Lower alluvial flat remnants adjacent to fan skirts  
*Contrasting features:* Silty throughout the profile  
*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 3

*Position on landscape:* Higher alluvial flat remnants adjacent to fan skirts  
*Contrasting features:* Loamy throughout the profile  
*Distinctive present vegetation:* Black greasewood, shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—very poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Poor—too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—too sandy, excess salt  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Droughty  
*Terraces and diversions:* Erodes easily, too sandy

### Interpretive Groups

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated  
*Range site:* 024X003N

## 971—Soolake very fine sandy loam, 2 to 8 percent slopes

### Map Unit Setting

*Position on landscape:* Fan skirts  
*Elevation:* 4,400 to 4,700 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### Composition

#### Major components:

- Soolake very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, sandy, mixed, mesic—90 percent
- Contrasting inclusions:*
  - Inclusion 1: Blacka very fine sandy loam, 2 to 4 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—10 percent

### Characteristics of the Soolake Soil

*Position on landscape:* Fan skirts  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth

**Typical Profile**

- 0 to 13 inches—very fine sandy loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 13 to 22 inches—fine sandy loam, very fine sandy loam; massive; soft, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4
- 22 to 60 inches or more—stratified loamy fine sand to sand; 5 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-2

**Soil and Water Features**

- Depth to seasonal high water table:* More than 60 inches
- Frequency of flooding:* None
- Permeability:* Moderately rapid
- Available water capacity:* 5.4 to 7.0 inches
- Water-supplying capacity:* 7 inches
- Runoff:* Very slow
- Hydrologic group:* B
- Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3
- Hazard of erosion:* By water—slight; by wind—slight
- Shrink-swell potential:* Low
- Corrosivity:* To steel—high; to concrete—moderate
- Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

- Position on landscape:* Adjacent fan piedmont remnants
- Contrasting features:* Strongly cemented duripan at a depth of 20 to 40 inches
- Distinctive present vegetation:* Shadscale, bud sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

- Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—very poor

**Ratings and Restrictive Features of the Soolake Soil for Selected Uses and Practices**

- Range seeding:* Poor—too arid, excess salt, excess sodium
- Daily cover for landfill:* Poor—too sandy
- Shallow excavations:* Severe—cutbanks cave
- Local roads and streets:* Slight
- Roadfill:* Good
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Poor—too sandy, excess salt
- Pond reservoir areas:* Severe—seepage
- Embankments, dikes, and levees:* Severe—piping, excess salt
- Drainage:* Deep to water
- Irrigation:* Droughty, slope
- Terraces and diversions:* Erodes easily, too sandy

**Interpretive Groups**

- Capability classification:* IIIe, irrigated, and VIIs, nonirrigated
- Range site:* 024X003N

**972—Soolake-Dunphy-Argenta association****Map Unit Setting**

- Position on landscape:* Basin floor
- Elevation:* 4,400 to 4,700 feet
- Average annual precipitation:* About 7 inches
- Average annual air temperature:* About 49 degrees F
- Frost-free season:* About 110 days

**Composition****Major components:**

- Soolake very fine sandy loam, 0 to 2 percent slopes—Typic Torriorthents, sandy, mixed, mesic—40 percent
- Dunphy very fine sandy loam, 0 to 2 percent slopes—Aeric Halaquepts, coarse-loamy, mixed (calcareous), mesic—30 percent
- Argenta fine sandy loam, 0 to 2 percent slopes—Aeric Halaquepts, coarse-loamy, mixed (calcareous), mesic—20 percent

**Contrasting inclusions:**

- Inclusion 1: Wendane silt loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Goldrun fine sand, 0 to 4 percent slopes—Xeric Torripsamments, mixed, mesic—5 percent

**Characteristics of the Soolake Soil**

- Position on landscape:* Fan skirts near margins of alluvial flat remnants
- Parent material:* Mixed alluvium
- Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, bud sagebrush

### Typical Profile

- 0 to 13 inches—very fine sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 13 to 22 inches—fine sandy loam, very fine sandy loam; massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4
- 22 to 60 inches or more—stratified loamy fine sand to sand; 5 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 5.4 to 7.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Characteristics of the Dunphy Soil

*Position on landscape:* Alluvial flat remnants  
*Parent material:* Mixed alluvium influenced by volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, basin wildrye, inland saltgrass

### Typical Profile

- 0 to 6 inches—very fine sandy loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 50 to 65); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 6 to 54 inches—very fine sandy loam, fine sandy loam; massive; slightly hard, very friable; very strongly

alkaline (pH 9.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

54 to 60 inches or more—strongly cemented duripan; massive; very hard, very firm

### Soil and Water Features

*Depth to hardpan:* 40 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 5.7 to 6.8 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—3; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Characteristics of the Argenta Soil

*Position on landscape:* Alluvial flats  
*Parent material:* Kind—alluvium; source—volcanic rock  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, basin wildrye, inland saltgrass

### Typical Profile

- 0 to 7 inches—fine sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 50 to 65); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
- 7 to 45 inches—stratified fine sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 45 to 60 inches or more—gravelly sandy loam; 35 to 45 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to seasonal high water table:* February through July—32 to 40 inches; rest of year—below 40 inches  
*Frequency of flooding:* Rare

*Permeability:* Moderate  
*Available water capacity:* 6.5 to 9.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channeled areas of alluvial flats  
*Contrasting features:* Frequently flooded  
*Distinctive present vegetation:* Black greasewood, basin wildrye, alkali sacaton

#### **Inclusion 2**

*Position on landscape:* Sand dunes overplacing alluvial flats  
*Contrasting features:* Sandy throughout the profile  
*Distinctive present vegetation:* Basin big sagebrush, needleandthread

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Soolake soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Dunphy soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Argenta soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Soolake Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—too sandy, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, piping

#### **Ratings of the Dunphy Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Fair—thin layer

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage, cemented pan

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

#### **Ratings of the Argenta Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—wetness

*Local roads and streets:* Severe—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, excess sodium, excess salt

### **Interpretive Groups**

*Capability classification:* Soolake soil—IIIs, irrigated, and VIIs, nonirrigated; Dunphy soil—VIIs, nonirrigated; Argenta soil—VIw, irrigated, and VIIw, nonirrigated

*Range site:* Soolake soil—024X003N; Dunphy soil—024X011N; Argenta soil—024X011N

## **980—Sombrero very fine sandy loam**

### **Map Unit Setting**

*Position on landscape:* Basin floor

*Elevation:* 4,400 to 4,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Sombrero very fine sandy loam, 0 to 2 percent slopes—Aquentic Durorthids, loamy, mixed, mesic, shallow—90 percent

#### **Contrasting inclusions:**

- Inclusion 1: Duffer very fine sandy loam, 0 to 2 percent slopes—Aquic Calciorthids, fine-silty, carbonatic, mesic—4 percent

- Inclusion 2: Reese silt loam, 0 to 2 percent slopes—

Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—3 percent

- Inclusion 3: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—3 percent

### **Characteristics of the Sombrero Soil**

*Position on landscape:* Stream terraces

*Parent material:* Loess capped, loamy mixed alluvium influenced by volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, littleleaf horsebrush, rubber rabbitbrush, basin wildrye

### **Typical Profile**

- 0 to 4 inches—very fine sandy loam; prismatic structure; slightly hard, very friable; very strongly alkaline (pH 9.2); strongly saline (30 to 50 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 4 to 16 inches—silt loam, silty clay loam; platy structure; hard, friable; strongly alkaline (pH 9.0); strongly saline (30 to 40 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 16 to 42 inches—strongly cemented duripan; massive; very hard, very firm
- 42 to 60 inches or more—stratified loam to gravelly sand; 10 to 45 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 9.0); moderately to strongly saline (8 to 20 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—SM, ML, GM; estimated AASHTO classification—A-2, A-4

### **Soil and Water Features**

*Depth to hardpan:* 15 to 20 inches

*Depth to seasonal high water table:* March through June—36 to 60 inches; rest of year—below 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.9 to 3.2 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Alluvial flat remnants

*Contrasting features:* Very deep

*Distinctive present vegetation:* Iodinebush

#### **Inclusion 2**

*Position on landscape:* Smooth flood plains

*Contrasting features:* Lacks duripan

*Distinctive present vegetation:* Black greasewood

#### **Inclusion 3**

*Position on landscape:* Alluvial flats

*Contrasting features:* Very deep

*Distinctive present vegetation:* Black greasewood, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—cemented pan, too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, excess salt

*Pond reservoir areas:* Severe—seepage, cemented pan

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Cemented pan, erodes easily, excess salt

*Terraces and diversions:* Cemented pan, erodes easily, too sandy

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X007N

### **990—Sonoma silt loam, drained**

#### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,500 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Sonoma silt loam, drained, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Sonoma silt loam, slightly saline, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—9 percent
- Inclusion 2: Fluvaquentic Haplaquolls, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—6 percent

### **Characteristics of the Sonoma Soil**

*Position on landscape:* Channeled and gullied flood plain remnants

*Parent material:* Silty mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—silt loam; subangular blocky structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-6

8 to 60 inches or more—stratified silty clay loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Flood plains and backwater channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Basin wildrye, black greasewood, basin big sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth to concave, active flood plains near channels

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Fair—too clayey

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—too clayey

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Moderate—piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 025X003N

### **991—Sonoma silt loam, drained, slightly saline**

#### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,400 to 4,900 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Sonoma silt loam, drained, slightly saline, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—85 percent

#### **Contrasting inclusions:**

- Inclusion 1: Parana silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—10 percent
- Inclusion 2: Soolake very fine sandy loam, 0 to 2 percent slopes—Typic Torriorthents, sandy, mixed, mesic—3 percent
- Inclusion 3: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—2 percent

### **Characteristics of the Sonoma Soil**

*Position on landscape:* Channeled and gullied flood plain remnants

*Parent material:* Silty mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Basin wildrye, inland saltgrass

### **Typical Profile**

0 to 8 inches—silt loam; subangular blocky structure; hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 60 inches or more—stratified silty clay loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 15 to 30); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Small, irregularly shaped slightly lower areas on active flood plains

*Contrasting features:* Thick, dark colored surface layer, poorly drained

*Distinctive present vegetation:* Sedge

#### **Inclusion 2**

*Position on landscape:* Fanlettes from adjacent fan piedmonts

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Bud sagebrush, black greasewood, rabbitbrush

#### **Inclusion 3**

*Position on landscape:* Alluvial flats adjacent to flood plains

*Contrasting features:* Somewhat poorly drained

*Distinctive present vegetation:* Basin wildrye, black greasewood, alkali sacaton

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—fair; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X007N

## 992—Sonoma silt loam, strongly saline, rarely flooded

### Map Unit Setting

*Position on landscape:* Flood plains

*Elevation:* 4,400 to 4,900 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Sonoma silt loam, strongly saline, 0 to 2 percent slopes, rarely flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Parana silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 2: Soolake very fine sandy loam, 0 to 2 percent slopes—Typic Torriorthents, sandy, mixed, mesic—3 percent
- Inclusion 3: Rixie silty clay loam, 0 to 2 percent slopes—Aquic Duric Haploxerolls, fine-loamy, mixed, mesic—2 percent
- Inclusion 4: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—2 percent

### Characteristics of the Sonoma Soil

*Position on landscape:* Flood plains

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, pepperweed, inland saltgrass, basin wildrye

### Typical Profile

0 to 8 inches—silt loam; subangular blocky structure; hard, friable; very strongly alkaline (pH 9.4); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

8 to 60 inches or more—stratified silty clay loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Small, irregularly shaped slightly lower areas of flood plains

*Contrasting features:* Frequently flooded, poorly drained

*Distinctive present vegetation:* Basin wildrye, creeping wildrye, willows

#### Inclusion 2

*Position on landscape:* Fanlettes from adjacent fan piedmonts

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 3

*Position on landscape:* Lower areas of flood plains

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Sedge

#### Inclusion 4

*Position on landscape:* Adjacent alluvial flats

*Contrasting features:* Somewhat poorly drained

*Distinctive present vegetation:* Black greasewood, basin wildrye, rubber rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—good

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength, frost action



*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—excess salt  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* VIs, irrigated, and VIIs, nonirrigated  
*Range site:* 024X007N

## **993—Sonoma silty clay loam, frequently flooded**

### **Map Unit Setting**

*Position on landscape:* Flood plains  
*Elevation:* 4,400 to 4,900 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Sonoma silty clay loam, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Humboldt silty clay, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcareous), mesic—5 percent
- Inclusion 2: Parana silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Rose Creek silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—5 percent

### **Characteristics of the Sonoma Soil**

*Position on landscape:* Flood plains  
*Parent material:* Silty mixed alluvium influenced by volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Basin wildrye, inland saltgrass

### **Typical Profile**

0 to 8 inches—silty clay loam; subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 8); estimated Unified

classification—CL; estimated AASHTO classification—A-6, A-7

8 to 65 inches or more—stratified silty clay loam to silt loam; massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through June—18 to 36 inches; rest of year—below 36 inches  
*Flooding:* Frequency—frequent; duration—brief or long; months—December through June  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave channels and depressions of flood plains  
*Contrasting features:* Thick, dark colored surface layer, clayey throughout profile  
*Distinctive present vegetation:* Basin wildrye, creeping wildrye

#### **Inclusion 2**

*Position on landscape:* Small, irregularly shaped slightly lower areas on flood plains  
*Contrasting features:* Thick, dark colored surface layer  
*Distinctive present vegetation:* Basin wildrye, creeping wildrye

#### **Inclusion 3**

*Position on landscape:* Small irregularly shaped areas adjacent to flood plain channels  
*Contrasting features:* Thick, dark colored surface layer; sandy loam throughout the profile  
*Distinctive present vegetation:* Basin wildrye, creeping wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops

(irrigated)—fair; domestic grasses and legumes  
 (irrigated)—fair; wild herbaceous plants  
 (nonirrigated)—poor; shrubs (nonirrigated)—poor;  
 wetland plants—good; shallow water areas—fair

#### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt  
*Daily cover for landfill:* Fair—too clayey, wetness  
*Shallow excavations:* Severe—wetness  
*Local roads and streets:* Severe—low strength, flooding, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—excess salt, too clayey  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—wetness  
*Drainage:* Flooding, percs slowly, frost action  
*Irrigation:* Wetness, erodes easily  
*Terraces and diversions:* Wetness, erodes easily

#### **Interpretive Groups**

*Capability classification:* IIIw, irrigated, and VIw, nonirrigated  
*Range site:* 025X001N

### **994—Sonoma silty clay loam, drained, strongly saline, occasionally flooded**

#### **Map Unit Setting**

*Position on landscape:* Flood plains  
*Elevation:* 4,400 to 4,900 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

#### **Composition**

##### **Major components:**

- Sonoma silty clay loam, drained, strongly saline, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—85 percent

##### **Contrasting inclusions:**

- Inclusion 1: Prida silt loam, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—4 percent
- Inclusion 2: Soolake very fine sandy loam, 0 to 2 percent slopes—Typic Torriorthents, sandy, mixed, mesic—4 percent
- Inclusion 3: Rixie silty clay loam, strongly saline, 0 to 2 percent slopes—Aquic Duric Haploxerolls, fine-loamy, mixed, mesic—4 percent
- Inclusion 4: Wendane silt loam, 0 to 2 percent

slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—3 percent

#### **Characteristics of the Sonoma Soil**

*Position on landscape:* Channeled and gullied flood plain remnants

*Parent material:* Silty mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, inland saltgrass, basin wildrye

#### **Typical Profile**

0 to 8 inches—silty clay loam; subangular blocky structure; hard, friable; very strongly alkaline (pH 9.4); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7  
 8 to 60 inches or more—stratified silty clay loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

#### **Soil and Water Features**

*Depth to seasonal high water table:* December through May—42 to 60 inches; rest of year—below 60 inches

*Flooding:* Frequency—occasional; duration—brief; months—March through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Alluvial flat remnants adjacent to flood plains

*Contrasting features:* Weakly silica-cemented layer in the substratum

*Distinctive present vegetation:* Iodinebush, alkali sacaton

##### **Inclusion 2**

*Position on landscape:* Fanlettes from adjacent fan piedmonts

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Shadscale, black greasewood

#### **Inclusion 3**

*Position on landscape:* Depressional areas on flood plains

*Contrasting features:* Thick, dark colored surface layer

*Distinctive present vegetation:* Alkali cordgrass, sedge

#### **Inclusion 4**

*Position on landscape:* Alluvial flats adjacent to flood plains

*Contrasting features:* Somewhat poorly drained

*Distinctive present vegetation:* Black greasewood, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—good

#### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt

*Shallow excavations:* Moderate—wetness, flooding

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt, flooding

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X007N

### **995—Sonoma silty clay loam, strongly saline, occasionally flooded**

#### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,400 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Sonoma silty clay loam, strongly saline, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—90 percent

#### **Contrasting inclusions:**

- Inclusion 1: Parana silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Prida silt loam, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 3: Rixie silty clay loam, strongly saline, 0 to 2 percent slopes—Aquic Duric Haploxerolls, fine-loamy, mixed, mesic—2 percent

### **Characteristics of the Sonoma Soil**

*Position on landscape:* Flood plains

*Parent material:* Silty mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Alkali sacaton, inland saltgrass, basin wildrye, iodinebush

### **Typical Profile**

0 to 8 inches—silty clay loam; subangular blocky structure; hard, friable; strongly alkaline (pH 9.0); strongly saline (25 to 50 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

8 to 60 inches or more—silty clay loam, silt loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through June—18 to 36 inches; rest of year—below 36 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Small, irregularly shaped slightly lower areas on flood plains

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Sedge

#### **Inclusion 2**

*Position on landscape:* Alluvial flat remnants adjacent to flood plains

*Contrasting features:* Rarely flooded

*Distinctive present vegetation:* Iodinebush, alkali sacaton

#### **Inclusion 3**

*Position on landscape:* Slightly higher areas on flood plains

*Contrasting features:* Weakly silica-cemented strata in the subsoil

*Distinctive present vegetation:* Sedge, alkali cordgrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Fair—too clayey, wetness

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, wetness

*Drainage:* Percs slowly, flooding, frost action

*Irrigation:* Wetness, perc slowly, erodes easily

*Terraces and diversions:* Erodes easily, wetness

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X009N

## **996—Sonoma, strongly saline-Sonoma complex**

### **Map Unit Setting**

*Position on landscape:* Basin floors

*Elevation:* 5,600 to 5,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Sonoma silty clay loam, strongly saline, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—60 percent
- Sonoma silty clay, slightly saline, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—30 percent

*Contrasting inclusions:*

- Inclusion 1: Aquic Durorthidic Torriorthents, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty over clayey, mixed (calcareous), mesic—5 percent
- Inclusion 2: Ocala silt loam, 0 to 2 percent slopes, rarely flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Sonoma, Strongly Saline, Soil**

*Position on landscape:* Irregularly shaped basin floor remnants at a distance from springs and seeps

*Parent material:* Silty mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, basin wildrye

### **Typical Profile**

0 to 12 inches—silty clay loam; subangular blocky structure; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 50 to 80); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

12 to 60 inches or more—silty clay loam, silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

## Soil and Water Features

*Depth to seasonal high water table:* 18 to 36 inches  
*Flooding:* Frequency—frequent; duration—brief or long; months—February through June  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* High

## Characteristics of the Sonoma Soil

*Position on landscape:* Basin floor remnants close to springs and seeps  
*Parent material:* Silty mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Inland saltgrass, sedge, alkali sacaton

## Typical Profile

0 to 12 inches—silty clay; angular blocky structure; hard, friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—MH; estimated AASHTO classification—A-7  
 12 to 60 inches or more—stratified silty clay loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

## Soil and Water Features

*Depth to seasonal high water table:* 18 to 36 inches  
*Flooding:* Frequency—frequent; duration—brief or long; months—February through June  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* High

## Contrasting Inclusions

### Inclusion 1

*Position on landscape:* Irregularly shaped, lower lake plain terraces  
*Contrasting features:* Clayey substratum  
*Distinctive present vegetation:* Black greasewood, basin wildrye

### Inclusion 2

*Position on landscape:* Coppice dune areas on low lake plain terraces  
*Contrasting features:* Water table fluctuates to below 40 inches in summer and fall  
*Distinctive present vegetation:* Black greasewood

## Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland, irrigated cropland

## Wildlife habitat elements:

*Suitability of the Sonoma, strongly saline, soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

*Suitability of the Sonoma soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—fair

## Ratings and Restrictive Features of the Sonoma, Strongly Saline, Soil for Selected Uses and Practices

*Range seeding:* Poor—excess salt, excess sodium  
*Daily cover for landfill:* Fair—wetness, too clayey  
*Shallow excavations:* Severe—wetness  
*Local roads and streets:* Severe—low strength, flooding, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—excess salt, wetness  
*Drainage:* Percs slowly, flooding, frost action  
*Irrigation:* Wetness, perc slowly, erodes easily  
*Terraces and diversions:* Erodes easily, wetness

## Ratings and Restrictive Features of the Sonoma Soil for Selected Uses and Practices

*Range seeding:* Poor—excess salt, excess sodium  
*Daily cover for landfill:* Fair—wetness, too clayey

*Shallow excavations:* Severe—wetness  
*Local roads and streets:* Severe—low strength, flooding, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—excess salt, too clayey  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—wetness  
*Drainage:* Percs slowly, flooding, frost action  
*Irrigation:* Wetness, slow intake, erodes easily  
*Terraces and diversions:* Erodes easily, wetness

### **Interpretive Groups**

*Capability classification:* Sonoma, strongly saline, soil—Vlw, irrigated, and VIIw, nonirrigated; Sonoma soil—IIIw, irrigated, and VIw, nonirrigated  
*Range site:* Sonoma, strongly saline, soil—024X007N; Sonoma soil—024X009N

## **997—Sonoma silty clay loam, strongly saline, frequently flooded**

### **Map Unit Setting**

*Position on landscape:* Basin floor remnants  
*Elevation:* 5,600 to 5,700 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 47 degrees F  
*Frost-free season:* About 100 days

### **Composition**

#### **Major components:**

- Sonoma silty clay loam, strongly saline, 0 to 2 percent slopes, frequently flooded—Aeric Fluvaquents, fine-silty mixed (calcareous), mesic—90 percent

#### **Contrasting inclusions:**

- Inclusion 1: Gund silt loam, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty over clayey, mixed, nonacid, mesic—5 percent
- Inclusion 2: Ocala silt loam, 0 to 2 percent slopes, rarely flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Sonoma Soil**

*Position on landscape:* Basin floor remnants near springs and seeps  
*Parent material:* Silty mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Basin wildrye, alkali sacaton, black greasewood

### **Typical Profile**

0 to 8 inches—silty clay loam; platy structure; slightly hard, friable; strongly alkaline (pH 9.0); strongly

saline (25 to 50 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
 8 to 60 inches or more—silty clay loam, silt loam; massive; hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through June—18 to 36 inches; rest of year—below 36 inches  
*Flooding:* Frequency—frequent; duration—brief or long; months—February through June  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Higher lake plain terraces  
*Contrasting features:* Clayey substratum  
*Distinctive present vegetation:* Basin wildrye, basin big sagebrush, black greasewood

#### **Inclusion 2**

*Position on landscape:* Lower lake plain terraces  
*Contrasting features:* Ponds after high intensity rains  
*Distinctive present vegetation:* Black greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium  
*Daily cover for landfill:* Fair—too clayey, wetness

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, wetness

*Drainage:* Percs slowly, flooding, frost action

*Irrigation:* Wetness, percs slowly, erodes easily

*Terraces and diversions:* Erodes easily, wetness

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X007N

## **1021—Susie Creek-Millerlux association**

### **Map Unit Setting**

*Position on landscape:* Plateaus

*Elevation:* 5,500 to 6,500 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 75 days

### **Composition**

*Major components:*

- Susie Creek silt loam, 2 to 8 percent slopes—Durargidic Argixerolls, fine, montmorillonitic, frigid—60 percent

- Millerlux very cobbly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, clayey, montmorillonitic, frigid—25 percent

*Contrasting inclusions:*

- Inclusion 1: Aridic Argixerolls, 8 to 15 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—9 percent

- Inclusion 2: Rock outcrop—3 percent

- Inclusion 3: Chen extremely cobbly loam, 4 to 8 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—3 percent

### **Characteristics of the Susie Creek Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—basalt and andesite

*Slope features:* Length—long; shape—slightly concave to slightly convex

*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, basin wildrye, bottlebrush squirreltail

### **Typical Profile**

0 to 9 inches—silt loam; 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

9 to 27 inches—silty clay, clay, clay loam; 5 to 15 percent pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, CL; estimated AASHTO classification—A-7

27 to 42 inches—sandy loam, loam; 5 to 25 percent pebbles (by weight); massive; hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

42 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 27 inches—slow; below this depth—moderate

*Available water capacity:* 6.2 to 7.9 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—3; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Millerlux Soil**

*Position on landscape:* Side slopes of plateaus

*Parent material:* Kind—residuum influenced by volcanic ash; source—basalt and tuffs

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Low sagebrush, bottlebrush squirreltail, Thurber needlegrass, bluebunch wheatgrass

*Surface cover:* 40 percent cobbles

### **Typical Profile**

0 to 10 inches—very cobbly loam; 25 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm);

nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-6, A-4

10 to 15 inches—clay; 0 to 10 percent cobbles and stones and 0 to 15 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH; estimated AASHTO classification—A-7

15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 12 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 2.0 to 2.4 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave side slopes of hills adjacent to plateaus  
*Contrasting features:* Bedrock at a depth of 60 to 80 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, basin wildrye

#### Inclusion 2

*Position on landscape:* Rimrock along shoulder slopes of plateaus  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

#### Inclusion 3

*Position on landscape:* Higher crests of foothills adjacent to plateaus  
*Contrasting features:* Bedrock at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Low sagebrush, Idaho fescue

### Wildlife habitat elements:

*Suitability of the Susie Creek soil for named elements:*  
 Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Millerlux soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Susie Creek Soil for Selected Uses

*Range seeding:* Fair—droughty, too arid  
*Daily cover for landfill:* Poor—too clayey, hard to pack  
*Shallow excavations:* Moderate—depth to bedrock, too clayey  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Poor—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—too clayey  
*Pond reservoir areas:* Moderate—seepage, depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Millerlux Soil for Selected Uses

*Range seeding:* Poor—droughty, large stones  
*Daily cover for landfill:* Poor—depth to bedrock, hard to pack  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Severe—depth to bedrock, low strength, shrink-swell  
*Roadfill:* Poor—depth to bedrock, low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Susie Creek soil—VIs, nonirrigated; Millerlux soil—VIIs, nonirrigated  
*Range site:* Susie Creek soil—024X014N; Millerlux soil—024X018N

## 1031—Teman silt loam

### Map Unit Setting

*Position on landscape:* Inset fans and fan skirts  
*Elevation:* 4,500 to 4,700 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### Composition

*Major components:*  
 • Teman silt loam, 0 to 2 percent slopes—Durixerollic Calciorthids, fine-silty, mixed, mesic—85 percent



*Contrasting inclusions:*

- Inclusion 1: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—4 percent
- Inclusion 2: Goldrun fine sand, 0 to 4 percent slopes—Xeric Torripsamments, mixed, mesic—4 percent
- Inclusion 3: Landco silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty over clayey, mixed (calcareous), mesic—4 percent
- Inclusion 4: Yipor silt loam, saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—3 percent

**Characteristics of the Teman Soil**

*Position on landscape:* Fan skirts and inset fans

*Parent material:* Kind—silty alluvium high in pyroclastic materials; source—mostly volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, black greasewood, rubber rabbitbrush, basin wildrye

**Typical Profile**

0 to 8 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

8 to 63 inches or more—silt loam, silty clay loam; massive; hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 25 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Upper areas on fan skirts

*Contrasting features:* Coarse-silty throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 2**

*Position on landscape:* Sand sheets overplacing parts of fan skirts

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Basin big sagebrush, Indian ricegrass

**Inclusion 3**

*Position on landscape:* Adjacent alluvial flats remnants

*Contrasting features:* Clayey substratum

*Distinctive present vegetation:* Saltbush, alkali sacaton

**Inclusion 4**

*Position on landscape:* Lower margins of fan skirts adjacent to alluvial flat remnants

*Contrasting features:* Well drained; saline-sodic surface layer

*Distinctive present vegetation:* Black greasewood, shadscale

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* IIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X006N

**1032—Teman silt loam, clayey substratum****Map Unit Setting**

*Position on landscape:* Fan skirts and inset fans

*Elevation:* 4,500 to 4,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Teman silt loam, clayey substratum, 0 to 2 percent slopes—Durixerollic Calciorthids, fine-silty, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Goldrun fine sand, 0 to 4 percent slopes—Xeric Torripsamments, mixed, mesic—10 percent
- Inclusion 2: Landco silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty over clayey, mixed (calcareous), mesic—3 percent
- Inclusion 3: Duffer very fine sandy loam, 0 to 2 percent slopes—Aquic Calciorthids, fine-silty, carbonatic, mesic—2 percent

**Characteristics of the Teman Soil**

*Position on landscape:* Fan skirts and inset fans

*Parent material:* Kind—silty alluvium high in pyroclastic materials; source—volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, mustards, basin wildrye

**Typical Profile**

0 to 8 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.9); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

8 to 40 inches—silt loam, silty clay loam; massive; hard, friable; strongly alkaline (pH 8.8); strongly saline (16 to 25 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

40 to 60 inches or more—silty clay; massive; hard, friable; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—MH; estimated AASHTO classification—A-7

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Sand sheets and dunes overplacing fan skirts

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Basin big sagebrush, Indian ricegrass

**Inclusion 2**

*Position on landscape:* Alluvial flat remnants adjacent to fan skirts

*Contrasting features:* Clayey substratum at a depth of 20 to 40 inches

*Distinctive present vegetation:* Saltbush

**Inclusion 3**

*Position on landscape:* Adjacent alluvial flats

*Contrasting features:* Seasonal high water table in spring months

*Distinctive present vegetation:* Iodinebush, alkali sacaton

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Fair—thin layer

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Percs slowly, erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* VIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X006N

## **1033—Teman silt loam, strongly saline**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,500 to 4,200 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Teman silt loam, strongly saline, 0 to 2 percent slopes—Durixerollic Calciorthids, fine-silty, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durothidic Torriorthents, fine-silty, mixed (calcareous), mesic—10 percent
- Inclusion 2: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—3 percent
- Inclusion 3: Landco silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty over clayey, mixed (calcareous), mesic—2 percent

### **Characteristics of the Teman Soil**

*Position on landscape:* Fan skirts

*Parent material:* Kind—silty alluvium high in pyroclastics; source—volcanic rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, inland saltgrass, basin wildrye

### **Typical Profile**

- 0 to 8 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6
- 8 to 63 inches or more—silt loam, silty clay loam; massive; hard, friable; strongly alkaline (pH 8.8); strongly saline (16 to 25 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Alluvial flat remnants adjacent to fan skirts

*Contrasting features:* Lacks layer of lime accumulation

*Distinctive present vegetation:* Black greasewood, shadscale

#### **Inclusion 2**

*Position on landscape:* Upper parts of fan skirts

*Contrasting features:* Surface layer not saline-sodic

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Alluvial flat remnants adjacent to lower margins of fan skirts

*Contrasting features:* Clayey substratum

*Distinctive present vegetation:* Saltbush, alkali sacaton

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—piping, excess salt

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* VIs, irrigated, and VIIs, nonirrigated

*Range site:* 024X006N

## **1040—Tenabo, gravelly-Allor-Tenabo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 5,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Tenabo gravelly very fine sandy loam, 8 to 15 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—40 percent

- Allor very cobbly loam, 15 to 30 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—25 percent

- Tenabo very cobbly loam, 4 to 15 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Haplargids, 15 to 30 percent slopes—Typic Haplargids, fine, montmorillonitic, mesic—8 percent

- Inclusion 2: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—7 percent

### **Characteristics of the Tenabo, Gravelly, Soil**

*Position on landscape:* South-facing side slopes of fan piedmont remnants

*Parent material:* Thin loess mantle influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, spiny hopsage, Indian ricegrass

### **Typical Profile**

0 to 6 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2

6 to 18 inches—clay loam, gravelly clay loam, silty clay loam; 10 to 30 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

18 to 40 inches—indurated duripan; massive; extremely hard, extremely firm

40 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 5 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); single grained; loose; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 15 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.2 to 3.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of the Allor Soil**

*Position on landscape:* North-facing side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, bluegrass

### **Typical Profile**

0 to 12 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 55 percent pebbles

(by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-2, A-4

12 to 34 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6, A-7

34 to 60 inches or more—gravelly loamy sand, very gravelly loamy sand; 0 to 10 percent cobbles and stones and 35 to 55 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.7 to 6.0 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Tenabo Soil**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Thin loess mantle influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, spiny hopsage, bud sagebrush, bluegrass

#### **Typical Profile**

0 to 6 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 18 inches—clay loam, sandy clay loam; 5 to 15 percent pebbles (by weight); prismatic structure;

slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL; estimated AASHTO classification—A-6

18 to 40 inches—indurated duripan; massive; extremely hard, extremely firm

40 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 10 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); single grained; loose; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* 15 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.3 to 2.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Convex, north-facing side slopes of fan piedmont remnants

*Contrasting features:* Clayey subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

##### **Inclusion 2**

*Position on landscape:* Inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

##### **Wildlife habitat elements:**

*Suitability of the Tenabo, gravelly, soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Allor soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Tenabo soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Tenabo, Gravelly, Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan, small stones, area reclaim

*Pond reservoir areas:* Severe—cemented pan, seepage, slope

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Allor Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Tenabo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, seepage, slope

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Tenabo, gravelly, soil—IVe, irrigated, and VIIs, nonirrigated; Allor soil—VIIs, nonirrigated; Tenabo soil—VIIs, nonirrigated

*Range site:* Tenabo, gravelly, soil—024X002N; Allor soil—024X005N; Tenabo soil—024X002N

### **1041—Tenabo-Ricert association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,800 to 6,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Tenabo silt loam, 0 to 4 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—60 percent
- Ricert gravelly silt loam, 2 to 4 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Whirlo gravelly loam, 4 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 2: Durorthidic Torriorthents, 4 to 8 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 3: Creemon silt loam, 2 to 4 percent slope—Duric Camborthids, coarse-silty, mixed, mesic—5 percent

#### **Characteristics of the Tenabo Soil**

*Position on landscape:* Higher summits of fan piedmont remnants

*Parent material:* Thin loess mantle high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush

#### **Typical Profile**

0 to 13 inches—silt loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 20 inches—clay loam, gravelly clay loam, silty clay loam; 5 to 30 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

20 to 39 inches—indurated duripan; massive; extremely hard, extremely firm

39 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 5 to 25 percent cobbles and stones and 35 to 65 percent pebbles (by weight); single grained; loose; very

strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 9 to 20 inches  
*Depth to seasonal high water table:* More than 20 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.8 to 4.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.55; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Characteristics of the Ricert Soil

*Position on landscape:* Lower summits of fan piedmont remnants  
*Parent material:* Thin loess deposits over mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush

### Typical Profile

0 to 6 inches—gravelly silt loam; 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4  
 6 to 18 inches—loam, clay loam; 0 to 15 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.5); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
 18 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; very hard, very firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* In the upper 18 inches—moderately slow; below this depth—moderately rapid  
*Available water capacity:* 4.4 to 6.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fan aprons overlaping fan piedmont remnants  
*Contrasting features:* Very gravelly throughout the profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Inset fans  
*Contrasting features:* Lacks layer of clay accumulation  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Adjacent fan skirts  
*Contrasting features:* Silty throughout the profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, homesites

#### Wildlife habitat elements:

*Suitability of the Tenabo soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Ricert soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Tenabo Soil for Selected Uses

*Range seeding:* Poor—too arid, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, seepage  
*Embankments, dikes, and levees:* Severe—excess sodium, excess salt, seepage

#### **Ratings of the Ricert Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Interpretive Groups**

*Capability classification:* Tenabo soil—IVe, irrigated, and VIIs, nonirrigated; Ricert soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Tenabo soil—024X002N; Ricert soil—024X002N

### **1042—Tenabo very gravelly loam, 2 to 8 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,400 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Tenabo very gravelly loam, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—85 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 15 to 30 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 2: Golconda very gravelly silt loam, 2 to 8 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—5 percent
- Inclusion 3: Doowak very loamy sand, 2 to 4 percent slopes—Xeric Torriorthents, sandy-skeletal, mixed, mesic—3 percent
- Inclusion 4: Cumulic Haploxerolls, 0 to 4 percent

slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, mesic—2 percent

#### **Characteristics of the Tenabo Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Thin loess mantle high in volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Bud sagebrush, shadscale, bottlebrush squirreltail

#### **Typical Profile**

- 0 to 6 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1
- 6 to 18 inches—clay loam, gravelly clay loam, silty clay loam; 10 to 30 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 18 to 40 inches—indurated duripan; massive; extremely hard, extremely firm
- 40 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 5 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); single grained; loose; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* 15 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.2 to 3.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low



### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Very deep soil that lacks a duripan

*Distinctive present vegetation:* Big sagebrush, Thurber needlegrass

#### Inclusion 2

*Position on landscape:* Lower summits of fan piedmont remnants

*Contrasting features:* Strongly cemented duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Inset fans

*Contrasting features:* Very deep soil that receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 4

*Position on landscape:* Adjacent to channels of inset fans, near the mountain front

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings for Selected Uses

*Range seeding:* Poor—too arid, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan, small stones, area reclaim

*Pond reservoir areas:* Severe—cemented pan, seepage

*Embankments, dikes, and levees:* Severe—excess sodium, seepage, excess salt

### Interpretive Groups

*Capability classification:* IVe, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

### 1062—Tomera-Snapp-Whirlo association

#### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 5,600 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### Composition

##### Major components:

- Tomera gravelly loam, 8 to 15 percent slopes—Xerollic Natrargids, fine, montmorillonitic, mesic—50 percent
- Snapp gravelly very fine sandy loam, 4 to 8 percent slopes—Durixerollic Natrargids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—20 percent
- Whirlo gravelly sandy loam, 4 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—15 percent

##### Contrasting inclusions:

- Inclusion 1: Aridic Haploxerolls, 4 to 8 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, mesic—10 percent
- Inclusion 2: Xeric Torriorthents, 4 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

#### Characteristics of the Tomera Soil

*Position on landscape:* Upper fan piedmont remnants

*Parent material:* Kind—alluvium high in pyroclastic materials; source—mixed sedimentary rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Indian ricegrass

#### Typical Profile

0 to 8 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, GM, SM-SC, GM-GC; estimated AASHTO classification—A-2, A-4

8 to 33 inches—gravelly sandy clay, gravelly clay; 25 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 15 to 30); estimated Unified classification—CH, SC; estimated AASHTO classification—A-7

33 to 60 inches or more—extremely gravelly sandy loam, very gravelly loamy sand, very cobbly loam; 1 to 40 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; soft, very

friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 30); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 33 inches—slow; below this depth—moderately rapid  
*Available water capacity:* 5.6 to 7.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Moderate

### Characteristics of the Snapp Soil

*Position on landscape:* Lower fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, Indian ricegrass  
*Surface cover:* 45 percent pebbles

### Typical Profile

0 to 10 inches—gravelly very fine sandy loam; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2  
 10 to 30 inches—clay, gravelly clay, gravelly clay loam; 10 to 50 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GC, CH; estimated AASHTO classification—A-7  
 30 to 60 inches or more—extremely gravelly loamy sand, very gravelly loamy sand; 50 to 85 percent pebbles (by weight); massive; hard, brittle; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SP-SM, GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* In the upper 30 inches—slow; below this depth—moderate  
*Available water capacity:* 5.2 to 7.1 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—3; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Moderate

### Characteristics of the Whirlo Soil

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium influenced by loess  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush

### Typical Profile

0 to 7 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4  
 7 to 13 inches—gravelly sandy loam, gravelly loam, fine sandy loam; 0 to 10 percent cobbles and stones and 15 to 45 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4  
 13 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 5 to 30 percent cobbles and stones and 50 to 75 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.9 to 5.3 inches  
*Water-supplying capacity:* 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Fan aprons on the upper parts of fan piedmont remnants  
*Contrasting features:* Very stony, thick, dark colored surface layer  
*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Upper part of inset fans  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Tomera soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Snapp soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Tomera Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—hard to pack

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—shrink-swell, low strength

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—too clayey, small stones, area reclaim

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Ratings of the Snapp Soil for Selected Uses**

*Range seeding:* Poor—excess sodium

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess sodium

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Tomera soil—VIs, nonirrigated;

Snapp soil—IIIe, irrigated, and VIs, nonirrigated;

Whirlo soil—IIIe, irrigated, and VIIc, nonirrigated

*Range site:* Tomera soil—024X005N; Snapp soil—024X005N; Whirlo soil—024X002N

## **1080—Trunk-Burrita association**

### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 4,800 to 5,600 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Trunk very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—60 percent

- Burrita very cobbly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Natrargids, 15 to 30 percent slopes—Typic Natrargids, fine, montmorillonitic, mesic—5 percent

- Inclusion 2: Rock outcrop—5 percent

- Inclusion 3: Xerollic Haplargids, 4 to 8 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—5 percent

### **Characteristics of the Trunk Soil**

*Position on landscape:* Side slopes of foothills

*Parent material:* Kind—colluvium over residuum;  
source—metasedimentary rocks

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush,  
small rabbitbrush, Indian ricegrass, pine bluegrass

### Typical Profile

0 to 5 inches—very cobbly loam; 30 to 45 percent  
cobbles and stones and 25 to 50 percent pebbles  
(by weight); granular structure; slightly hard, friable;  
mildly alkaline (pH 7.6); nonsaline (less than 2  
mmhos/cm); nonsodic (SAR less than 2); estimated  
Unified classification—SC, GC, SM-SC, GM-GC;  
estimated AASHTO classification—A-4, A-6

5 to 28 inches—gravelly clay loam, gravelly clay; 0 to  
10 percent cobbles and stones and 20 to 50  
percent pebbles (by weight); prismatic structure;  
hard, firm; moderately alkaline (pH 8.2); nonsaline  
(less than 2 mmhos/cm); nonsodic (SAR less than  
2); estimated Unified classification—CL, GC, CH;  
estimated AASHTO classification—A-7

28 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.0 to 3.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—  
2; wind erodibility group—8

*Hazard of erosion:* By water—Moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Characteristics of the Burríta Soil

*Position on landscape:* Crest and shoulder slopes of  
foothills

*Parent material:* Kind—residuum; source—metamorphic  
rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush,  
small rabbitbrush, pine bluegrass, Indian ricegrass,  
spiny hopsage

### Typical Profile

0 to 3 inches—very cobbly loam; 25 to 40 percent  
cobbles and stones and 35 to 45 percent pebbles  
(by weight); platy structure; slightly hard, very  
friable; moderately alkaline (pH 8.0); nonsaline (less

than 2 mmhos/cm); nonsodic (SAR less than 2);  
estimated Unified classification—GM-GC; estimated  
AASHTO classification—A-4

3 to 18 inches—very cobbly clay, very stony clay loam,  
very gravelly clay loam; 10 to 55 percent cobbles  
and stones and 45 to 70 percent pebbles (by  
weight); angular blocky structure; hard, firm;  
moderately alkaline (pH 8.2); nonsaline (less than 2  
mmhos/cm); nonsodic (SAR less than 2); estimated  
Unified classification—GC, SC; estimated AASHTO  
classification—A-2, A-7

18 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.5 to 2.0 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—  
1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly concave foot slopes of  
foothills

*Contrasting features:* 40 to 60 inches deep to bedrock

*Distinctive present vegetation:* Shadscale, bud  
sagebrush

#### Inclusion 2

*Position on landscape:* Scattered peaks of foothills

*Contrasting features:* Bedrock exposed at the soil  
surface

*Distinctive present vegetation:* Barren

#### Inclusion 3

*Position on landscape:* Toe slopes of foothills

*Contrasting features:* Receives additional moisture from  
runoff

*Distinctive present vegetation:* Wyoming big sagebrush,  
spiny hopsage

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Trunk soil for named elements:* Wild  
herbaceous plants (nonirrigated)—fair; shrubs  
(nonirrigated)—fair

*Suitability of the Burrita soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Trunk Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—depth to bedrock, low strength, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Burrita Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Interpretive Groups**

*Capability classification:* Trunk soil—VIIIs, nonirrigated; Burrita soil—VIIIs, nonirrigated

*Range site:* Trunk soil—024X005N; Burrita soil—024X005N

### **1082—Trunk-Reina association**

#### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Trunk loam, 8 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—50 percent
- Reina loam, 4 to 15 percent slopes—Xerollic Durargids, clayey-skeletal, montmorillonitic, mesic, shallow—35 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—10 percent
- Inclusion 2: Rubble land—5 percent

#### **Characteristics of the Trunk Soil**

*Position on landscape:* Lower side slopes of foothills

*Parent material:* Kind—residuum and colluvium;

source—sedimentary and metasedimentary rocks

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, bottlebrush squirreltail, Sandberg bluegrass

#### **Typical Profile**

0 to 5 inches—loam; 0 to 20 percent pebbles (by weight); granular structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

5 to 28 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

28 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.0 to 3.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### **Characteristics of the Reina Soil**

*Position on landscape:* Upper side slopes of foothills

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—andesite, basalt, tuff, and quartzite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush,

rabbitbrush, bluebunch wheatgrass, Thurber  
needlegrass

*Surface cover:* 15 percent pebbles

### Typical Profile

0 to 7 inches—loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

7 to 18 inches—very gravelly clay, very gravelly clay loam; 10 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); prismatic structure; very hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2, A-7

18 to 26 inches—indurated duripan; massive; very hard, firm

26 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 22 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.0 to 2.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Rimrock and exposed bedrock on severely eroded side slopes of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Rock stringers below rock outcrop

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Reina soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Trunk Soil for Selected Uses

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—depth to bedrock, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Reina Soil for Selected Uses

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—cemented pan, depth to bedrock

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Trunk soil—VIIe, nonirrigated; Reina soil—VIIs, nonirrigated

*Range site:* Trunk soil—024X005N; Reina soil—024X005N

### 1084—Trunk-Burrita-Rock outcrop association

#### Map Unit Setting

*Position on landscape:* Foothills

*Elevation:* 4,800 to 5,600 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Trunk cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—40 percent
- Burrita very cobbly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—25 percent
- Rock outcrop—20 percent

#### Contrasting inclusions:

- Inclusion 1: Xerollic Haplargids, 4 to 15 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent
- Inclusion 2: Xerollic Durargids, 15 to 30 percent slopes—Xerollic Durargids, clayey-skeletal, montmorillonitic, mesic—5 percent
- Inclusion 3: Xeric Torriorthents, 15 to 30 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—4 percent
- Inclusion 4: Typic Torriorthents, 30 to 50 percent slopes—Typic Torriorthents, clayey-skeletal, montmorillonitic (calcareous), mesic—1 percent

### Characteristics of the Trunk Soil

*Position on landscape:* Side slopes of foothills

*Parent material:* Kind—colluvium and residuum;  
source—metasedimentary rocks

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush,  
small rabbitbrush, Indian ricegrass, pine bluegrass

#### Typical Profile

0 to 5 inches—cobbly loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); very gravelly; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

5 to 28 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

28 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.0 to 3.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Characteristics of the Burrita Soil

*Position on landscape:* Crests and shoulder slopes of foothills

*Parent material:* Kind—residuum; source—metamorphic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush,  
small rabbitbrush, pine bluegrass, Indian ricegrass,  
spiny hopsage

#### Typical Profile

0 to 3 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

3 to 18 inches—very cobbly clay, very stony clay loam, very gravelly clay loam; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7

18 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.5 to 2.0 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Rimrock and eroded side slopes of foothills

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex upper crests of foothills

*Contrasting features:* Abrupt textural boundary

*Distinctive present vegetation:* Low sagebrush, bluegrass, Thurber needlegrass

#### **Inclusion 2**

*Position on landscape:* Concave to slightly convex foot slopes of foothills

*Contrasting features:* A duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

#### **Inclusion 3**

*Position on landscape:* Side slopes of drainageway

*Contrasting features:* Soil is more than 40 inches deep

*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

#### **Inclusion 4**

*Position on landscape:* Eroded side slopes of foothills

*Contrasting features:* Surface layer eroded

*Distinctive present vegetation:* Wyoming big sagebrush, shadscale

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Burrita soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Trunk Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—depth to bedrock, low strength, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Burrita Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Trunk soil—VIIIs, nonirrigated;

Burrita soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Trunk soil—024X005N; Burrita soil—024X005N

## **1085—Trunk-Dewar-Stingdorn association**

### **Map Unit Setting**

*Position on landscape:* Foothills and interhill fan piedmont remnants

*Elevation:* 5,500 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Trunk gravelly loam, 15 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—35 percent
- Dewar very cobbly loam, 15 to 50 percent slopes—Xerollic Durargids, loamy, mixed, mesic, shallow—30 percent

- Stingdorn very cobbly loam, 8 to 15 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Abruptic Xerollic Durargids, 15 to 30 percent slopes—Abruptic Xerollic Durargids, fine, montmorillonitic, mesic—6 percent

- Inclusion 2: Xerollic Durorthids, 8 to 30 percent slopes—Xerollic Durorthids, loamy-skeletal, mixed, mesic, shallow—5 percent

- Inclusion 3: Veta very gravelly fine sandy loam, 4 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—3 percent

- Inclusion 4: Rock outcrop—1 percent

### **Characteristics of the Trunk Soil**

*Position on landscape:* North- and east-facing crests and side slopes of foothills



*Parent material:* Kind—residuum and colluvium;  
source—various sedimentary rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush,  
Indian ricegrass, bottlebrush squirreltail

*Surface cover:* 15 percent pebbles, 10 percent cobbles

### Typical Profile

0 to 5 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); granular structure; slightly hard; friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GC, SM-SC, GM, SM; estimated AASHTO classification—A-4

5 to 28 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

28 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.0 to 3.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Characteristics of the Dewar Soil

*Position on landscape:* Interhill fan piedmont remnants

*Parent material:* Silty mixed alluvium

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, Indian ricegrass, bottlebrush squirreltail

### Typical Profile

0 to 4 inches—very cobbly loam; 40 to 50 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than

2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

4 to 14 inches—cobbly silty clay loam; 25 to 30 percent cobbles and stones and 10 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

14 to 19 inches—very cobbly silty loam; 30 to 40 percent cobbles and stones and 45 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6

19 to 32 inches—indurated duripan; massive; extremely hard, extremely firm

32 to 60 inches or more—gravelly sandy loam; 40 to 50 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 13 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.0 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Stingdorn Soil

*Position on landscape:* South- and west-facing summits and shoulder slopes of foothills

*Parent material:* Kind—residuum; source—rhyolitic bedrock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 7 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 45 percent pebbles

(by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SC; estimated AASHTO classification—A-2, A-4

- 7 to 15 inches—very cobbly loam, clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-6
- 15 to 20 inches—indurated duripan; massive; extremely hard, extremely firm
- 20 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 8 to 20 inches  
*Depth to bedrock:* 8 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.5 to 1.9 inches  
*Water-supplying capacity:* 6 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Highest part of interhill fan piedmont remnants  
*Contrasting features:* Abrupt textural boundary at top of clayey subsoil  
*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

#### Inclusion 2

*Position on landscape:* Lower south-facing side slopes of foothills  
*Contrasting features:* Very gravelly sandy loam subsoil  
*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

#### Inclusion 3

*Position on landscape:* Adjacent to drainageways and channels of foothills and fan piedmont remnants  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 4

*Position on landscape:* Scattered peaks of foothills  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Dewar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### Ratings of the Trunk Soil for Selected Uses

*Range seeding:* Poor—erodes easily  
*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—low strength, shrink-swell, slope  
*Roadfill:* Poor—depth to bedrock, low strength, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Dewar Soil for Selected Uses

*Range seeding:* Poor—large stones, droughty  
*Daily cover for landfill:* Poor—cemented pan, slope  
*Shallow excavations:* Severe—cemented pan, slope  
*Local roads and streets:* Severe—cemented pan, slope  
*Roadfill:* Poor—cemented pan  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, cemented pan, slope  
*Pond reservoir areas:* Severe—seepage, cemented pan, slope  
*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Stingdorn Soil for Selected Uses

*Range seeding:* Poor—too arid, droughty, large stones  
*Daily cover for landfill:* Poor—depth to bedrock, large stones  
*Shallow excavations:* Severe—depth to bedrock, cemented pan  
*Local roads and streets:* Severe—depth to bedrock  
*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, depth to bedrock, large stones

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Trunk soil—VIIe, nonirrigated; Dewar soil—VIIs, nonirrigated; Stingdorn soil—VIIs, nonirrigated

*Range site:* Trunk soil—024X005N; Dewar soil—024X005N; Stingdorn soil—024X002N

## **1086—Trunk-Malpais-Minat association**

### **Map Unit Setting**

*Position on landscape:* Hills

*Elevation:* 5,500 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 100 days

### **Composition**

*Major components:*

- Trunk cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—45 percent
- Malpais gravelly loam, 30 to 50 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—25 percent
- Minat gravelly loam, 30 to 50 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Oxcorel very fine sandy loam, 4 to 15 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—7 percent
- Inclusion 2: Puett very gravelly loam, 30 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—6 percent
- Inclusion 3: Durixerollic Haplargids, 8 to 15 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—2 percent

### **Characteristics of the Trunk Soil**

*Position on landscape:* Crest and shoulder slopes of hills

*Parent material:* Kind—colluvium over residuum; source—various sedimentary rocks

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, Indian ricegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—cobbly loam; 15 to 30 percent cobbles

and stones and 10 to 30 percent pebbles (by weight); granular structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4

5 to 28 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

28 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.0 to 3.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Malpais Soil**

*Position on landscape:* South- and west-facing side slopes of hills

*Parent material:* Kind—colluvium influenced by loess and volcanic ash; source—basalt and andesite

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, shadscale

*Surface cover:* 15 percent pebbles, 10 percent cobbles and stones

### **Typical Profile**

0 to 3 inches—gravelly loam; 5 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-4

3 to 15 inches—very gravelly loam, very cobbly sandy loam, very gravelly sandy loam; 5 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly

hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

15 to 60 inches or more—stratified extremely cobbly loam to extremely cobbly sandy loam; 40 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.6 to 5.4 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Minat Soil**

*Position on landscape:* North- and east-facing side slopes of hills  
*Parent material:* Kind—colluvium influenced by volcanic ash; source—chert, shale, and volcanic rock  
*Slope features:* Length—long; shape—slightly concave to convex  
*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, Indian ricegrass, phlox, ephedra, small rabbitbrush

### **Typical Profile**

0 to 9 inches—gravelly loam; 5 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6  
 9 to 27 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

27 to 60 inches or more—very gravelly fine sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 5.8 to 7.0 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth and slightly convex fan piedmont remnants adjacent to hills  
*Contrasting features:* Clayey, sodium-affected subsoil  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Slightly concave to convex back slopes of severely eroded parts of hills  
*Contrasting features:* Soft bedrock within a depth of 20 inches  
*Distinctive present vegetation:* Small rabbitbrush, black sagebrush

#### **Inclusion 3**

*Position on landscape:* Concave to smooth foot slopes adjacent to drainageways  
*Contrasting features:* Very gravelly clay loam subsoil  
*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass, bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Malpais soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Minat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Trunk Soil for Selected Uses**

*Range seeding:* Fair—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—depth to bedrock, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Malpais Soil for Selected Uses**

*Range seeding:* Poor—too arid, erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Minat Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

#### **Interpretive Groups**

*Capability classification:* Trunk soil—VII, nonirrigated; Malpais soil—VIIe, nonirrigated; Minat soil—VIIe, nonirrigated

*Range site:* Trunk soil—024X005N; Malpais soil—024X026N; Minat soil—024X005N

### **1087—Trunk-Burrita-Colbar association**

#### **Map Unit Setting**

*Position on landscape:* Low hills

*Elevation:* 5,400 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

##### *Major components:*

- Trunk very cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—45 percent

- Burrita very cobbly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—25 percent

- Colbar very cobbly loam, 15 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—15 percent

##### *Contrasting inclusions:*

- Inclusion 1: Duric Natrargids, 15 to 30 percent slopes—Duric Natrargids, loamy-skeletal, mixed, mesic—5 percent

- Inclusion 2: Lithic Xerollic Haplargids, 8 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent

- Inclusion 3: Xerollic Haplargids, 4 to 15 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—3 percent

- Inclusion 4: Rock outcrop—2 percent

#### **Characteristics of the Trunk Soil**

*Position on landscape:* East-, west-, and south-facing side slopes of low hills

*Parent material:* Kind—residuum and colluvium; source—metasedimentary rocks

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bottlebrush squirreltail, Sandberg bluegrass

#### **Typical Profile**

0 to 5 inches—very cobbly loam; 30 to 45 percent cobbles and stones and 25 to 50 percent pebbles (by weight); granular structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC, SC, GC; estimated AASHTO classification—A-4, A-6

5 to 28 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

28 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 2.9 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

**Characteristics of the Burrita Soil**

*Position on landscape:* Crest and shoulder slopes of low hills  
*Parent material:* Kind—residuum; source—metamorphic rocks  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bottlebrush squirreltail

**Typical Profile**

0 to 3 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4  
 3 to 18 inches—very cobbly clay, very stony clay loam, very gravelly clay loam; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7  
 18 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.5 to 2.0 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

**Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of low hills  
*Parent material:* Kind—residuum and colluvium; source—andesite and dacite  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bottlebrush squirreltail, pine bluegrass

**Typical Profile**

0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 3 to 22 inches—cobbly loam, gravelly clay loam, cobbly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
 26 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth, lower, south-facing side slopes of low hills

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Convex, north-facing crests and shoulder slopes of low hills

*Contrasting features:* Calcareous subsoil

*Distinctive present vegetation:* Black sagebrush, small rabbitbrush

#### **Inclusion 3**

*Position on landscape:* Concave side slopes adjacent to incipient drainageways

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 4**

*Position on landscape:* Occurs randomly as small peaks

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Burrita soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Trunk Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—depth to bedrock, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Burrita Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Trunk soil—VIIIs, nonirrigated; Burrita soil—VIIIs, nonirrigated; Colbar soil—VIIIs, nonirrigated

*Range site:* Trunk soil—024X005N; Burrita soil—024X005N; Colbar soil—024X005N

## **1091—Tulase silt loam, 2 to 8 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 5,600 to 5,900 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 105 days

### **Composition**

*Major components:*

- Tulase silt loam, 2 to 8 percent slopes—Durorthidic Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 2 to 8 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—10 percent

- Inclusion 2: Xeric Torriorthents, 2 to 8 percent slopes—Xeric Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Tulase Soil**

*Position on landscape:* Slightly dissected fan skirts

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 6 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

6 to 60 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 9.0 to 12.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent inset fans

*Contrasting features:* Fine sandy loam layers in the substratum

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Lower margins of fan skirts

*Contrasting features:* Silty clay loam throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* IIIe, irrigated, and VIc, nonirrigated

*Range site:* 025X019N

## **1092—Tulase-Bubus-McConnel association**

### **Map Unit Setting**

*Position on landscape:* Basin floor and piedmont slopes

*Elevation:* 5,000 to 5,800 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 105 days

### **Composition**

*Major components:*

- Tulase silt loam, 2 to 8 percent slopes—Durorthidic Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic—40 percent
  - Bubus very fine sandy loam, slightly saline, 2 to 4 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—30 percent
  - McConnel loam, 0 to 4 percent slopes—Xerollic Camborthids, sandy-skeletal, mixed, mesic—15 percent
- Contrasting inclusions:*

- Inclusion 1: Duric Camborthids, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent
- Inclusion 2: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

### **Characteristics of the Tulase Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by loess and volcanic ash



*Slope features:* Length—short; shape—slightly concave to slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, Indian ricegrass, bottlebrush squirreltail, small rabbitbrush

### Typical Profile

0 to 6 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

6 to 60 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 9.0 to 12.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Bubus Soil

*Position on landscape:* Alluvial flat remnants

*Parent material:* Mixed alluvium high in pyroclastics

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 6 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 60 inches or more—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); strongly saline (more than 16 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified

classification—ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 9.0 to 10.2 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Characteristics of the McConnel Soil

*Position on landscape:* Offshore bars

*Parent material:* Mixed alluvium influenced by loess and volcanic ash over lacustrine beach sediments

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, Indian ricegrass, small rabbitbrush, pine bluegrass

*Surface cover:* 20 percent pebbles

### Typical Profile

0 to 2 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

2 to 12 inches—loam, sandy loam, fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

12 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones and 65 to 90 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 12 inches—moderately rapid; below this depth—very rapid  
*Available water capacity:* 3.1 to 4.4 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.37; T value—2; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth inset fans dissecting beach plains  
*Contrasting features:* Layer of weak silica accumulation  
*Distinctive present vegetation:* Shadscale, black greasewood

#### **Inclusion 2**

*Position on landscape:* Concave inset fans dissecting beach plains  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Smooth to slightly convex remnants of offshore bars  
*Contrasting features:* Loamy and very gravelly throughout the profile  
*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

#### **Wildlife habitat elements:**

*Suitability of the Tulase soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Bubus soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the McConnel soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Tulase Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Bubus Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

#### **Ratings of the McConnel Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—too arid, area reclaim, small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Tulase soil—IIIe, irrigated, and VIc, nonirrigated; Bubus soil—IIc, irrigated, and VIIc, nonirrigated; McConnel soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Tulase soil—024X005N; Bubus soil—024X002N; McConnel soil—024X005N

## **1102—Tweba very fine sandy loam, drained, 0 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,800 to 5,100 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Tweba very fine sandy loam, drained, 0 to 4 percent

slopes—Aeric Fluvaquents, coarse-loamy, mixed (calcareous), mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Orovida fine sandy loam, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Wendane silt loam, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

**Characteristics of the Tweba Soil**

*Position on landscape:* Channeled and gullied flood plain remnants

*Parent material:* Loamy mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Basin big sagebrush, black greasewood, basin wildrye, rubber rabbitbrush

**Typical Profile**

- 0 to 11 inches—very fine sandy loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
- 11 to 21 inches—fine sandy loam, very fine sandy loam, loam; massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 21 to 60 inches or more—stratified very fine sandy loam to loamy sand; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

**Soil and Water Features**

*Depth to seasonal high water table:* February through June—36 to 42 inches; rest of year—below 42 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 5.6 to 9.2 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* Fanlettes from adjacent fan piedmont remnants

*Contrasting features:* Well drained

*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 2**

*Position on landscape:* Adjacent alluvial flats

*Contrasting features:* Strongly salt and sodium affected

*Distinctive present vegetation:* Black greasewood, halogeton

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

**Potential uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland, irrigated cropland

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Fair—excess salt

*Daily cover for landfill:* Fair—too sandy, wetness

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily

*Terraces and diversions:* Erodes easily, too sandy

**Interpretive Groups**

*Capability classification:* Illw, irrigated, and Vlw, nonirrigated

*Range site:* 024X006N

**1110—Umlerland silty clay loam, ponded**

**Map Unit Setting**

*Position on landscape:* Lake plains

*Elevation:* About 5,100 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Umberland silty clay loam, ponded, 0 to 2 percent slopes—Aeric Halaquepts, fine, montmorillonitic (calcareous), mesic—85 percent

#### Contrasting inclusions:

- Inclusion 1: Playas—10 percent
- Inclusion 2: Durixerollic Camborthids, 0 to 2 percent slopes—Durixerollic Camborthids, fine-silty, mixed, mesic—5 percent

### Characteristics of the Umberland Soil

*Position on landscape:* Lake plains

*Parent material:* Silty mixed lacustrine sediments

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Inland saltgrass

### Typical Profile

- 0 to 4 inches—silty clay loam; platy structure; hard, friable; strongly alkaline (pH 9.2); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-7
- 4 to 60 inches or more—silty clay, silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 13 to 25); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

### Soil and Water Features

*Depth to seasonal high water table:* June through December—12 to 30 inches; rest of year—below 30 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 9.0 to 12.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Ponded

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Sink areas on lake plains

*Contrasting features:* Ponded too long to support vegetation

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Fanlettes from adjacent fan piedmont remnants

*Contrasting features:* Well drained

*Distinctive present vegetation:* Basin big sagebrush, rubber rabbitbrush, inland saltgrass, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

#### Ratings for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium, too crusty

*Daily cover for landfill:* Poor—too clayey, hard to pack, ponding

*Shallow excavations:* Severe—ponding

*Local roads and streets:* Severe—low strength, shrink-swell, ponding

*Roadfill:* Poor—low strength, wetness, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, too clayey, wetness

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—ponding, excess sodium, excess salt

### Interpretive Groups

*Capability classification:* VIIw, nonirrigated

*Range site:* 026X002N

## 1140—Wendane silt loam, frequently flooded

### Map Unit Setting

*Position on landscape:* Alluvial flats

*Elevation:* 4,600 to 5,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Wendane silt loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—85 percent

#### Contrasting inclusions:

- Inclusion 1: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 2: Reese silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 3: Sonoma silty clay loam, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Wendane Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, basin wildrye, alkali rabbitbrush, inland saltgrass

### **Typical Profile**

- 0 to 13 inches—silt loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (30 to 50 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 13 to 27 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 27 to 65 inches or more—stratified silt loam to clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through July—30 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—frequent; duration—brief or long; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth adjacent fan skirts

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Black greasewood, shadscale

#### **Inclusion 2**

*Position on landscape:* Slightly higher alluvial flats

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Black greasewood

#### **Inclusion 3**

*Position on landscape:* Adjacent flood plain remnants

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

**Potential uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland, homesites

### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, wetness

*Local roads and streets:* Severe—flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Flooding, frost action, excess salt

*Irrigation:* Wetness, erodes easily, flooding

*Terraces and diversions:* Erodes easily, wetness

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X007N

## **1141—Wendane silt loam, sandy substratum**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,400 to 4,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Wendane silt loam, sandy substratum, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—85 percent

#### *Contrasting inclusions:*

- Inclusion 1: Argenta very fine sandy loam, 0 to 2 percent slopes—Aeric Halaquepts, coarse-loamy, mixed (calcareous), mesic—5 percent

- Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 3: Bubus very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent

- Inclusion 4: Reese silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—2 percent

### **Characteristics of the Wendane Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash capping sandy sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, inland saltgrass, alkali sacaton, basin wildrye

### **Typical Profile**

0 to 13 inches—silt loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (30 to 40 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 40 inches—silt loam, silty clay loam; subangular blocky structure; hard, firm; strongly alkaline (pH 8.8); strongly saline (40 to 60 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

40 to 60 inches or more—stratified sand to gravelly sand; 15 to 35 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* February through

July—30 to 48 inches; rest of year—below 47 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* In the upper 40 inches—moderately slow; below this depth—very rapid

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—4; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Upper margins of alluvial flats

*Contrasting features:* Coarser textured throughout the profile

*Distinctive present vegetation:* Black greasewood

#### **Inclusion 2**

*Position on landscape:* Alluvial flat remnants

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Black greasewood, shadscale

#### **Inclusion 3**

*Position on landscape:* Alluvial flat remnants adjacent to fan skirts

*Contrasting features:* Well drained

#### **Inclusion 4**

*Position on landscape:* Lower margins of alluvial flats

*Contrasting features:* Water table at a depth of 12 to 18 inches

*Distinctive present vegetation:* Black greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

**Potential uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland, homesites

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Fair—wetness

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

*Drainage:* Flooding, frost action, excess salt

*Irrigation:* Wetness, erodes easily, flooding

*Terraces and diversions:* Erodes easily, wetness

### **Interpretive Groups**

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X007N

## **1142—Wendane-Tweba association**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats and flood plains

*Elevation:* 4,800 to 5,100 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Wendane very fine sandy loam, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—55 percent

- Tweba very fine sandy loam, drained, 0 to 4 percent slopes—Aeric Fluvaquents, coarse-loamy, mixed (calcareous), mesic—35 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic—10 percent

### **Characteristics of the Wendane Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush

### **Typical Profile**

0 to 13 inches—very fine sandy loam; platy structure;

slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (30 to 50 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

13 to 27 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (25 to 40 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

27 to 60 inches or more—stratified silt loam to clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly to moderately sodic (SAR 20 to 40); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through July—30 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 10.8 to 12.0 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Characteristics of the Tweba Soil**

*Position on landscape:* Channeled and gullied areas of flood plains

*Parent material:* Loamy mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye, streambank wheatgrass

### **Typical Profile**

0 to 11 inches—very fine sandy loam; platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

11 to 21 inches—fine sandy loam, very fine sandy loam, loam; massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified

classification—ML; estimated AASHTO classification—A-4

- 21 to 60 inches or more—stratified very fine sandy loam to loamy sand; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

### Soil and Water Features

*Depth to seasonal high water table:* February through June—36 to 42 inches; rest of year—below 42 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 5.6 to 9.2 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fanlettes from adjacent fan skirts

*Contrasting features:* Silt loam throughout the profile

*Distinctive present vegetation:* Black greasewood, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Wendane soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

*Suitability of the Tweba soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

#### Ratings of the Wendane Soil for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, wetness

*Local roads and streets:* Severe—flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

#### Ratings of the Tweba Soil for Selected Uses

*Range seeding:* Fair—excess salt

*Daily cover for landfill:* Fair—too sandy, wetness

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* Wendane soil—VIIw, nonirrigated; Tweba soil—IIIw, irrigated, and VIw, nonirrigated

*Range site:* Wendane soil—024X011N; Tweba soil—024X006N

## 1143—Wendane silt loam, occasionally flooded

### Map Unit Setting

*Position on landscape:* Alluvial flats

*Elevation:* 4,500 to 5,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Wendane silt loam, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Wendane silt loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—10 percent
- Inclusion 2: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-silty, mixed (calcareous), mesic—3 percent
- Inclusion 3: Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—2 percent

### Characteristics of the Wendane Soil

*Position on landscape:* Alluvial flats



*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, seepweed

### Typical Profile

0 to 13 inches—silt loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (30 to 50 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 27 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (25 to 40 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

27 to 60 inches or more—stratified silt loam to clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* February through May—30 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—occasionally; duration—brief or long; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Lower areas of alluvial flats

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Black greasewood, basin wildrye

#### Inclusion 2

*Position on landscape:* Alluvial flat remnants

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Torrey quailbush, black greasewood

### Inclusion 3

*Position on landscape:* Slightly convex higher parts of alluvial flat remnants

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Shadscale, black greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated native pasture and hayland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—excess salt, excess sodium, too crusty

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, wetness

*Local roads and streets:* Severe—flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

*Drainage:* Flooding, frost action, excess salt

*Irrigation:* Wetness, erodes easily, flooding

*Terraces and diversions:* Erodes easily, wetness

### Interpretive Groups

*Capability classification:* VIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X011N

## 1144—Wendane-Batan-Broyles association

### Map Unit Setting

*Position on landscape:* Alluvial flats and fan skirts

*Elevation:* 4,600 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Wendane silt loam, 0 to 2 percent slopes, frequently

flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—30 percent

- Batan silt loam, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—30 percent

- Broyles silt loam, moderately saline, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—10 percent

- Inclusion 2: Reese silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—5 percent

### **Characteristics of the Wendane Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, basin wildrye, rubber rabbitbrush, inland saltgrass

### **Typical Profile**

0 to 13 inches—silt loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (30 to 50 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 27 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

27 to 60 inches or more—stratified silt loam to clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through May—30 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—frequent; duration—brief or long; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### **Characteristics of the Batan Soil**

*Position on landscape:* Alluvial flat remnants

*Parent material:* Kind—silty alluvium influenced by loess; source—volcanic rock high in pyroclastics

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, black greasewood

### **Typical Profile**

0 to 5 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 25 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 68 inches or more—stratified silt loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Broyles Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, black greasewood, inland saltgrass, spiny horsebrush

### **Typical Profile**

0 to 5 inches—silt loam; subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly

sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4

- 5 to 11 inches—silt loam, very fine sandy loam, fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
- 11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 6.3 to 7.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Adjacent smooth inset fans  
*Contrasting features:* Silty loam throughout the profile  
*Distinctive present vegetation:* Shadscale, black greasewood

#### Inclusion 2

*Position on landscape:* Margins of alluvial flats  
*Contrasting features:* A seasonal water table within a depth of 40 inches  
*Distinctive present vegetation:* Black greasewood, shadscale, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Wendane soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

*Suitability of the Batan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Broyles soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

### Ratings of the Wendane Soil for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, wetness

*Local roads and streets:* Severe—flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Ratings of the Batan Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Ratings of the Broyles Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* Wendane soil—VIIw, nonirrigated; Batan soil—IIIs, irrigated, and VIIs, nonirrigated; Broyles soil—IIs, irrigated, and VIIs, nonirrigated

*Range site:* Wendane soil—024X007N; Batan soil—024X003N; Broyles soil—024X003N

**1145—Wendane-Playas association****Map Unit Setting**

*Position on landscape:* Basin floors

*Elevation:* 4,500 to 4,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 120 days

**Composition**

*Major components:*

- Wendane silt loam, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—70 percent

- Playas—15 percent

*Contrasting inclusions:*

- Inclusion 1: Aquic Durorthidic Torriorthents, 0 to 2 percent slopes—Aquic Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 2: Wendane silt loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 3: Isolde fine sand, 4 to 30 percent slopes—Typic Torripsamments, mixed, mesic—5 percent

**Characteristics of the Wendane Soil**

*Position on landscape:* Alluvial flats

*Slope features:* Length—short; shape—slightly concave to slightly convex

*Dominant present vegetation:* Black greasewood, alkali rabbitbrush, seepweed

**Typical Profile**

0 to 13 inches—silt loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (30 to 50 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 27 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (25 to 40 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

27 to 60 inches or more—stratified silt loam to clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

**Soil and Water Features**

*Depth to seasonal high water table:* February through May—30 to 48 inches; rest of year—below 48 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

**Characteristics of the Playas**

*Position on landscape:* Dry lake and sink areas on basin floors

*Slope features:* Length—long; shape—smooth or slightly concave

*Dominant present vegetation:* None

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Concave channels of alluvial flats

*Contrasting features:* Less sodium affected

*Distinctive present vegetation:* Iodinebush, alkali sacaton, inland saltgrass

**Inclusion 2**

*Position on landscape:* Lower part of alluvial flats

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Black greasewood, basin wildrye, alkali rabbitbrush

**Inclusion 3**

*Position on landscape:* Convex, partially stabilized sand dunes adjacent to playas

*Contrasting features:* Sandy throughout the profile, excessively drained

*Distinctive present vegetation:* Black greasewood, spiny hopsage

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Wendane soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

**Ratings of the Wendane Soil for Selected Uses**

*Range seeding:* Poor—excess salt, excess sodium, too crusty

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, wetness  
*Local roads and streets:* Severe—flooding, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt, excess sodium  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Interpretive Groups**

*Capability classification:* Wendane soil—VIIw, nonirrigated; Playas—VIIIw  
*Range site:* Wendane soil—024X011N

## **1146—Wendane-Sonoma-Valmy association**

### **Map Unit Setting**

*Position on landscape:* Flood plains, alluvial flats, and fan skirts  
*Elevation:* 5,200 to 5,400 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Wendane silt loam, 0 to 2 percent slopes, frequently flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—35 percent
- Sonoma silt loam, drained, 0 to 2 percent slopes, occasionally flooded—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—30 percent
- Valmy very fine sandy loam, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Parana silt loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine-silty, mixed (calcareous), mesic—6 percent
- Inclusion 2: Aeric Halaquepts, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—6 percent
- Inclusion 3: Durorthidic Torriorthents, 2 to 8 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent

### **Characteristics of the Wendane Soil**

*Position on landscape:* Broad alluvial flats adjacent to flood plains  
*Parent material:* Mixed silty alluvium influenced by loess and volcanic ash  
*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, inland saltgrass, basin wildrye

### **Typical Profile**

- 0 to 13 inches—silt loam; platy structure; slightly hard, very friable; very strongly alkaline (pH 9.6); strongly saline (30 to 50 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 13 to 27 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 27 to 60 inches or more—stratified silt loam to clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); strongly saline (16 to 30 mmhos/cm); slightly to moderately sodic (SAR 20 to 35); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* February through May—30 to 48 inches; rest of year—below 48 inches  
*Flooding:* Frequency—frequent; duration—brief or long; months—February through June  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* High

### **Characteristics of the Sonoma Soil**

*Position on landscape:* Flood plains  
*Parent material:* Silty mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Black greasewood, basin big sagebrush, basin wildrye

### **Typical Profile**

- 0 to 10 inches—silt loam; subangular blocky structure; hard, friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 10 to 60 inches or more—stratified silty clay loam to silt

loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* March through June—42 to 60 inches; rest of year—less than 60 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—March through June

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### Characteristics of the Valmy Soil

*Position on landscape:* Fan skirts

*Parent material:* Loess mantled, loamy mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, basin big sagebrush, black greasewood

### Typical Profile

0 to 6 inches—very fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

6 to 42 inches—stratified very fine sandy loam to gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4, A-2, A-1

42 to 60 inches or more—gravelly sand, very gravelly sand; 0 to 10 percent cobbles and stones and 30 to 70 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM, SM, GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 4.7 to 6.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—4; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Active flood plains immediately adjacent to stream channels

*Contrasting features:* Thick, dark colored surface layer, very poorly drained

*Distinctive present vegetation:* Sedge, rush, creeping wildrye, willow

#### Inclusion 2

*Position on landscape:* Outer margins of flood plains

*Contrasting features:* Somewhat poorly drained

*Distinctive present vegetation:* Torrey quailbush, black greasewood

#### Inclusion 3

*Position on landscape:* Convex fanlettes emerging from steeper stream tributaries

*Contrasting features:* Slopes of 2 to 8 percent

*Distinctive present vegetation:* Black greasewood, shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

### Wildlife habitat elements:

*Suitability of the Wendane soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

*Suitability of the Sonoma soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Valmy soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### Ratings of the Wendane Soil for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, wetness

*Local roads and streets:* Severe—flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Ratings of the Sonoma Soil for Selected Uses**

*Range seeding:* Poor—excess salt

*Daily cover for landfill:* Fair—too clayey

*Shallow excavations:* Moderate—wetness, flooding

*Local roads and streets:* Severe—low strength, flooding, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Moderate—piping, wetness

### **Ratings of the Valmy Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Fair—small stones, thin layer

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Fair—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping, seepage, thin layer

### **Interpretive Groups**

*Capability classification:* Wendane soil—VIIw, nonirrigated; Sonoma soil—IIIw, irrigated, and VIIw, nonirrigated; Valmy soil—IIs, irrigated, and VIc, nonirrigated

*Range site:* Wendane soil—024X007N; Sonoma soil—024X006N; Valmy soil—024X022N

## **1150—Weso fine sandy loam**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,500 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Weso fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Blacka very fine sandy loam, 0 to 2 percent slopes—Entic Durorthids, coarse-loamy, mixed, mesic—5 percent

- Inclusion 2: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

- Inclusion 3: Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent

### **Characteristics of the Weso Soil**

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium with a loess mantle high in volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

5 to 11 inches—loam, fine sandy loam, very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, CL-ML, SM, SM-SC; estimated AASHTO classification—A-4

11 to 60 inches or more—fine sandy loam, very fine sandy loam; 5 to 5 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 7.8 to 9.4 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent nonburied fan piedmont remnants

*Contrasting features:* Strongly cemented duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Upper part of fan skirts

*Contrasting features:* Layer of weak silica accumulation not continuously cemented

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Lower margins of fan skirts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

#### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily, excess salt

*Terraces and diversions:* Erodes easily, soil blowing

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 024X002N

### **1158—Whirlo very fine sandy loam, 2 to 4 percent slopes, occasionally flooded**

#### **Map Unit Setting**

*Position on landscape:* Inset fans

*Elevation:* 4,500 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Whirlo very fine sandy loam, 2 to 4 percent slopes, occasionally flooded—Typic Camborthids, loamy-skeletal, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Creemon very fine sandy loam, strongly saline-sodic, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—6 percent
- Inclusion 2: Xerollic Camborthids, 2 to 4 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—4 percent

#### **Characteristics of the Whirlo Soil**

*Position on landscape:* Inset fans

*Parent material:* Gravelly mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, spiny hopsage

#### **Typical Profile**

- 0 to 7 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—SM; estimated AASHTO classification—A-4
- 7 to 13 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4



13 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—March through June  
*Permeability:* Moderately rapid  
*Available water capacity:* 4.7 to 5.9 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly concave adjacent fan skirts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Bud sagebrush

#### Inclusion 2

*Position on landscape:* Slightly lower areas and adjacent to channels of inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, Wyoming big sagebrush, basin wildrye

#### Inclusion 3

*Position on landscape:* Fanlettes from adjacent fan piedmont remnants

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Spiny hopsage, Wyoming big sagebrush, bottlebrush squirreltail

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### Ratings for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones, seepage

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* IIIw, irrigated, and VIIw, nonirrigated

*Range site:* 024X003N

## 1160—Whirlo gravelly loam, 2 to 8 percent slopes

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Whirlo gravelly loam, 2 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—90 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—4 percent

- Inclusion 2: Typic Camborthids, 2 to 8 percent slopes—Typic Camborthids, sandy-skeletal, mixed, mesic—3 percent

- Inclusion 3: Typic Nadurargids, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—3 percent

### Characteristics of the Whirlo Soil

*Position on landscape:* Broad inset fans

*Parent material:* Kind—alluvium influenced by loess; source—basalt, rhyolite, and tuffs

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 12 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated

Unified classification—ML, GM; estimated AASHTO classification—A-4

12 to 24 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 6 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.5 to 5.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly convex adjacent fan skirts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Areas adjacent to channels

*Contrasting features:* Very gravelly sand substratum

*Distinctive present vegetation:* Shadscale

#### Inclusion 3

*Position on landscape:* Fan piedmont remnants

*Contrasting features:* Indurated duripan at a depth of 10 to 20 inches

*Distinctive present vegetation:* Shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### Ratings for Selected Uses

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* IIIe, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

## 1162—Whirlo silt loam, 0 to 2 percent slopes

### Map Unit Setting

*Position on landscape:* Inset fans and fan skirts

*Elevation:* 4,400 to 4,900 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Whirlo silt loam, 0 to 2 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles very fine sandy loam, 4 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

- Inclusion 2: Creemon silt loam, 2 to 4 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent

- Inclusion 3: Wholan silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—5 percent

### Characteristics of the Whirlo Soil

*Position on landscape:* Inset fans and fan skirts

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass, bottlebrush squirreltail

### Typical Profile

- 0 to 12 inches—silt loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.1); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 12 to 24 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 24 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 4.9 to 6.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper margins of fan skirts  
*Contrasting features:* Fine sandy loam throughout the profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Lower margins of fan skirts  
*Contrasting features:* Silt loam throughout the profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Outer margins of inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Winterfat

### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

### Ratings and Restrictive Features for Selected Uses and Practices

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Poor—seepage, small stones  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—small stones, area reclaim, excess salt  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage  
*Drainage:* Deep to water  
*Irrigation:* Droughty  
*Terraces and diversions:* Erodes easily, droughty

### Interpretive Groups

*Capability classification:* IIs, irrigated, and VIIs, nonirrigated  
*Range site:* 024X002N

### 1163—Whirlo silt loam, 2 to 4 percent slopes

#### Map Unit Setting

*Position on landscape:* Inset fans  
*Elevation:* 4,600 to 5,600 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### Composition

#### Major components:

- Whirlo silt loam, 2 to 4 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—85 percent
- Contrasting inclusions:*
  - Inclusion 1: Broyles very fine sandy loam, 2 to 4

percent slopes—Duric Camborthids, coarse-loamy, mixed mesic—5 percent

• Inclusion 2: Creemon silt loam, 2 to 4 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent

• Inclusion 3: Wholan silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—5 percent

### **Characteristics of the Whirlo Soil**

*Position on landscape:* Inset fans

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 12 inches—silt loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.1); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

12 to 24 inches—stratified very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 4.9 to 6.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth lower part of inset fans

*Contrasting features:* Less than 35 percent rock fragments in the substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Smooth fan skirts at the terminus of inset fans

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Outer margins of inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Winterfat

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

*Drainage:* Deep to water

*Irrigation:* Droughty, slope

*Terraces and diversions:* Erodes easily

### **Interpretive Groups**

*Capability classification:* IIe, irrigated, and VIIs, nonirrigated

*Range site:* 024X002N

## 1165—Whirlo-Creemon association

### Map Unit Setting

*Position on landscape:* Inset fans

*Elevation:* 4,500 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Whirlo gravelly loam, 2 to 4 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—45 percent
- Creemon silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 2: Durixerollic Camborthids, 0 to 2 percent slopes, occasionally flooded—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Durixerollic Camborthids, 0 to 2 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

### Characteristics of the Whirlo Soil

*Position on landscape:* Inset fan remnants

*Parent material:* Very gravelly mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

- 0 to 12 inches—gravelly loam; 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, GM; estimated AASHTO classification—A-4
- 12 to 24 inches—very gravelly fine sandy loam, very gravelly loam, fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 24 to 60 inches or more—stratified very gravelly loam, extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline

(4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.5 to 5.0 inches

*Water-supplying capacity:* 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Characteristics of the Creemon Soil

*Position on landscape:* Irregularly channeled and overwashed parts of inset fans

*Parent material:* Silty mixed alluvium; influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

- 0 to 10 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 10 to 15 inches—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 15 to 45 inches—stratified very fine sandy loam to silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 45 to 60 inches or more—stratified gravelly very fine sandy loam to fine sandy loam; 15 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-4

## Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 9.8 to 12.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

## Contrasting Inclusions

### Inclusion 1

*Position on landscape:* Smooth to slightly concave lower portions of inset fans

*Contrasting features:* Strongly saline surface layer

*Distinctive present vegetation:* Black greasewood, shadscale

### Inclusion 2

*Position on landscape:* Areas adjacent to stream channels on the lower part of inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, bluegrass

### Inclusion 3

*Position on landscape:* Areas adjacent to stream channels on the upper part of inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

## Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available, homesites

## Wildlife habitat elements:

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Creemon soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

## Ratings of the Whirlo Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—small stones, seepage

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

## Ratings of the Creemon Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping, excess salt

## Interpretive Groups

*Capability classification:* Whirlo soil—Ile, irrigated, and VIIs, nonirrigated; Creemon soil—Ilc, irrigated, and VIIc, nonirrigated

*Range site:* Whirlo soil—024X002N; Creemon soil—024X002N

## 1166—Whirlo-Pumper silt loams

### Map Unit Setting

*Position on landscape:* Fan skirts

*Elevation:* 4,350 to 4,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

## Composition

*Major components:*

- Whirlo silt loam, 0 to 2 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—50 percent
- Pumper silt loam, 0 to 2 percent slopes—Typic Camborthids, sandy-skeletal, mixed, mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Orovada fine sandy loam, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—10 percent

## Characteristics of the Whirlo Soil

*Position on landscape:* Upper and middle part of fan skirts

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

- 0 to 12 inches—silt loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.1); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 12 to 24 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 24 to 60 inches or more—very gravelly sandy loam, extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 20 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 4.9 to 6.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Pumper Soil

*Position on landscape:* Lower fan skirts, adjacent to channels, and outwash areas  
*Parent material:* Loess high in volcanic ash over gravelly and sandy mixed alluvium  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

- 0 to 12 inches—silt loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated

Unified classification—ML; estimated AASHTO classification—A-4

- 12 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sand; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; hard, friable; moderately alkaline (pH 8.3); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 3.1 to 4.8 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper parts of inset fans  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Pumper soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### Ratings of the Whirlo Soil for Selected Uses

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Poor—seepage, small stones  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—small stones, area reclaim, excess salt  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Pumper Soil for Selected Uses***Range seeding:* Poor—too arid*Daily cover for landfill:* Poor—too sandy, small stones, seepage*Shallow excavations:* Severe—cutbanks cave*Local roads and streets:* Slight*Roadfill:* Good*Sand:* Probable source*Gravel:* Probable source*Topsoil:* Poor—too sandy, small stones, area reclaim*Pond reservoir areas:* Severe—seepage*Embankments, dikes, and levees:* Severe—seepage**Interpretive Groups***Capability classification:* Whirlo soil—VIIIs, nonirrigated; Pumper soil—IVs, irrigated, and VIIIs, nonirrigated*Range site:* Whirlo soil—024X002N; Pumper soil—024X002N**1168—Whirlo-Oxcorel association****Map Unit Setting***Position on landscape:* Piedmont slopes*Elevation:* 4,600 to 5,500 feet*Average annual precipitation:* About 7 inches*Average annual air temperature:* About 48 degrees F*Frost-free season:* About 110 days**Composition***Major components:*

- Whirlo gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—50 percent
- Oxcorel very fine sandy loam, 4 to 15 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—35 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 2 to 15 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—10 percent
- Inclusion 2: Durorthidic Torriorthents, 2 to 8 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

**Characteristics of the Whirlo Soil***Position on landscape:* Inset fans and fan skirts*Parent material:* Mixed alluvium influenced by loess*Slope features:* Length—short; shape—smooth*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail**Typical Profile**

0 to 12 inches—gravelly very fine sandy loam; 25 to 45 percent pebbles (by weight); platy structure; slightly

hard, friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, GM; estimated AASHTO classification—A-4

12 to 24 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1

24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features***Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* Moderately rapid*Available water capacity:* 4.0 to 5.4 inches*Water-supplying capacity:* 6 inches*Runoff:* Slow*Hydrologic group:* B*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4*Hazard of erosion:* By water—slight; by wind—slight*Shrink-swell potential:* Low*Corrosivity:* To steel—high; to concrete—low*Potential frost action:* Low**Characteristics of the Oxcorel Soil***Position on landscape:* Fan piedmont remnants*Parent material:* Mixed alluvium mantled by loess*Slope features:* Length—short; shape—convex*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail**Typical Profile**

0 to 5 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 20 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly



alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

20 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None

*Permeability:* In the upper 20 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 5.0 to 6.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fan drainageways and upper inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Lower margins of fan skirts

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Shadscale, black greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Whirlo Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Oxcorel Soil for Selected Uses

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey, slope

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, area reclaim

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### Interpretive Groups

*Capability classification:* Whirlo soil—IIIe, irrigated, and VIIs, nonirrigated; Oxcorel soil—VIIs, nonirrigated

*Range site:* Whirlo soil—024X002N; Oxcorel soil—024X002N

## 1169—Whirlo-Broyles association

### Map Unit Setting

*Position on landscape:* Fan skirts and inset fans

*Elevation:* 4,700 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Whirlo gravelly very fine sandy loam, 4 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—55 percent
- Broyles very fine sandy loam, 2 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—30 percent

#### Contrasting inclusions:

- Inclusion 1: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—9 percent
- Inclusion 2: Xeric Torriorthents, 2 to 8 percent

slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—6 percent

### **Characteristics of the Whirlo Soil**

*Position on landscape:* Upper fan skirts

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 12 inches—gravelly very fine sandy loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, GM; estimated AASHTO classification—A-4

12 to 24 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1

24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 4.0 to 5.4 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Broyles Soil**

*Position on landscape:* Lower fan skirts and inset fans

*Parent material:* Loess over loamy mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR 5 to 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; hard, friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 13 to 25); estimated Unified classification—SM; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 6.3 to 7.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave, upper inset fans and upper margins of fan skirts

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Adjacent to shallow stream channels

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

**Wildlife habitat elements:**

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Broyles soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Broyles Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

**Interpretive Groups**

*Capability classification:* Whirlo soil—IIIe, irrigated, and VIIc, nonirrigated; Broyles soil—IIe, irrigated, and VIIc, nonirrigated

*Range site:* Whirlo soil—024X002N; Broyles soil—024X002N

**1170—Wholan silt loam****Map Unit Setting**

*Position on landscape:* Fan skirts and inset fans

*Elevation:* 4,700 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Wholan silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Antel silt loam, 0 to 2 percent slopes—

Duric Camborthids, fine-silty, mixed, mesic—5 percent

- Inclusion 2: Creemon silt loam, 2 to 4 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent

- Inclusion 3: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—5 percent

**Characteristics of the Wholan Soil**

*Position on landscape:* Fan skirts and inset fans

*Parent material:* Loess capped, silty mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Winterfat, bud sagebrush, bottlebrush squirreltail, shadscale

**Typical Profile**

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 60 inches or more—very fine sandy loam, silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 9.7 to 11.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Smooth lower margins of fan skirts

*Contrasting features:* Layer of weak silica accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush, Indian ricegrass

**Inclusion 2**

*Position on landscape:* Smooth higher areas of fan skirt remnants and inset fans

*Contrasting features:* Layer of weak silica accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 3**

*Position on landscape:* Convex lower margins of fan skirts

*Contrasting features:* Layer of weak silica accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

**Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

**Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

*Drainage:* Deep to water

*Irrigation:* Erodes easily

*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 024X004N

**1174—Wholan silt loam, sandy substratum****Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,700 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Wholan silt loam, sandy substratum, 0 to 2 percent

slopes—Typic Camborthids, coarse-silty, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Relley silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-silty, mixed, mesic—10 percent
- Inclusion 2: Hessing silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—5 percent

**Characteristics of the Wholan Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess capped mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Winterfat, Indian ricegrass, bottlebrush squirreltail

**Typical Profile**

- 0 to 6 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 6 to 45 inches—very fine sandy loam, silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 45 to 60 inches or more—stratified very gravelly loam to very gravelly sand; 0 to 10 percent cobbles and stones and 60 to 70 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 8.2 to 10.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Lower areas of fan skirts

*Contrasting features:* Layer of weak silica accumulation  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Upper margins of fan skirts  
*Contrasting features:* Fine sandy loam and gravelly sandy loam throughout the profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### **Wildlife habitat elements:**

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

#### **Ratings and Restrictive Features for Selected Uses and Practices**

*Range seeding:* Poor—too arid, excess salt  
*Daily cover for landfill:* Fair—thin layer  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Fair—area reclaim, excess salt  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—hard to pack, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

#### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated  
*Range site:* 024X004N

### **1177—Wholan, strongly alkaline-Rasille association**

#### **Map Unit Setting**

*Position on landscape:* Fan skirts and inset fans  
*Elevation:* 5,400 to 5,800 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### **Composition**

##### *Major components:*

- Wholan very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—65 percent
  - Rasille silt loam, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-silty, mixed, mesic—20 percent
- Contrasting inclusions:*
- Inclusion 1: Kelk silt loam, 0 to 4 percent slopes, occasionally flooded—Durixerollic Camborthids, fine-silty, mixed, mesic—5 percent
  - Inclusion 2: Xerollic Camborthids, 0 to 2 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—5 percent
  - Inclusion 3: Creemon very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent

#### **Characteristics of the Wholan Soil**

*Position on landscape:* Broad fan skirts  
*Parent material:* Silty mixed alluvium influenced by loess  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Saltbush

#### **Typical Profile**

0 to 5 inches—very fine sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 5 to 60 inches or more—very fine sandy loam, silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* 9.7 to 11.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Rasille Soil**

*Position on landscape:* Inset fans

*Parent material:* Silty mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth and concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 6 inches—silt loam; platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 15 inches—very fine sandy loam, silt loam; prismatic structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 26 inches or more—very fine sandy loam, silt loam; massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 9.9 to 11.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Inset fans near lower margins of fan skirts

*Contrasting features:* Receives additional moisture from flooding

*Distinctive present vegetation:* Basin big sagebrush, black greasewood

##### **Inclusion 2**

*Position on landscape:* Concave higher areas of inset fans

*Contrasting features:* Loam and sandy loam throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

##### **Inclusion 3**

*Position on landscape:* Slightly convex higher areas of fan skirts

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

#### **Wildlife habitat elements:**

*Suitability of the Wholan soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Rasille soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Wholan Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Rasille Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

#### **Interpretive Groups**

*Capability classification:* Wholan soil—IIc, irrigated, and VIc, nonirrigated; Rasille soil—IIc, irrigated, and VIc, nonirrigated

*Range site:* Wholan soil—024X012N; Rasille soil—024X005N

**1178—Wholan-Rasille association****Map Unit Setting**

*Position on landscape:* Fan skirts and inset fans

*Elevation:* 5,000 to 5,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Wholan silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—60 percent
- Rasille silt loam, gravelly substratum, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-silty, mixed, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Camborthids, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—5 percent
- Inclusion 2: Duric Camborthids, 0 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Durixerollic Camborthids, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent

**Characteristics of the Wholan Soil**

*Position on landscape:* Fan skirts

*Parent material:* Silty mixed alluvium influenced by loess

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bud sagebrush, winterfat

**Typical Profile**

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 60 inches or more—very fine sandy loam, silt loam; massive; slightly hard, very friable; moderately alkaline (pH 8.2); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 9.7 to 11.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

**Characteristics of the Rasille Soil**

*Position on landscape:* Inset fans

*Parent material:* Silty mixed alluvium influenced by loess

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

**Typical Profile**

0 to 6 inches—silt loam; platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 15 inches—very fine sandy loam, silt loam; subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 41 inches—very fine sandy loam, silt loam; massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

41 to 60 inches or more—stratified fine sandy loam to very gravelly coarse sand; 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 7.6 to 9.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly convex lower margins of fan skirts

*Contrasting features:* Strongly alkaline surface layer

*Distinctive present vegetation:* Saltbush, bottlebrush squirreltail

#### **Inclusion 2**

*Position on landscape:* Slightly higher areas on fan skirts

*Contrasting features:* Loamy and coarse textured throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Inclusion 3**

*Position on landscape:* Convex upper margins of fan skirts

*Contrasting features:* Loamy and coarse textured throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland, wildlife habitat, irrigated cropland if irrigation water is made available

#### **Wildlife habitat elements:**

*Suitability of the Wholan soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Rasille soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Wholan Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—excess salt

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Rasille Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Fair—thin layer

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—area reclaim

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Wholan soil—IIc, irrigated, and VIIc, nonirrigated; Rasille soil—IIc, irrigated, and VIc, nonirrigated

*Range site:* Wholan soil—024X004N; Rasille soil—028B010N

## **1201—Slaven-Linrose-Cleavage association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,500 to 7,200 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Slaven very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—45 percent
- Linrose gravelly loam, 50 to 75 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—30 percent
- Cleavage very gravelly loam, 4 to 15 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—15 percent

*Contrasting inclusions:*

- Inclusion 1: Loncan loam, 30 to 75 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—7 percent
- Inclusion 2: Rock outcrop—2 percent
- Inclusion 3: Aridic Argixerolls, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—1 percent

### **Characteristics of the Slaven Soil**

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum influenced by loess; source—chert, shale, and quartzite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, arrowleaf balsamroot

### **Typical Profile**

0 to 4 inches—very gravelly loam; 55 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2);



estimated Unified classification—GM; estimated AASHTO classification—A-2

- 4 to 22 inches—extremely gravelly clay, extremely gravelly sandy clay, extremely gravelly clay loam; 0 to 15 percent cobbles and stones and 75 to 85 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 22 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.9 to 2.5 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Linrose Soil

*Position on landscape:* North- and east-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—chert, shale, and quartzite  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Black sagebrush, Idaho fescue, bluebunch wheatgrass

### Typical Profile

- 0 to 8 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, ML; estimated AASHTO classification—A-4
- 8 to 26 inches—very gravelly loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2
- 26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.5 to 3.7 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Very rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Cleavage Soil

*Position on landscape:* Spurs and crests of mountains  
*Parent material:* Kind—residuum; source—extrusive volcanic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, low sagebrush, bluebunch wheatgrass

### Typical Profile

- 0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2, A-4, A-6
- 4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 25 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.6 to 1.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave, south-facing side slopes of mountains

*Contrasting features:* Lacks layer of clay accumulation

*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue

#### **Inclusion 2**

*Position on landscape:* Random small peaks of mountains

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Convex, north-facing side slopes of mountains

*Contrasting features:* Receives additional moisture from drifted snow

*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Slaven soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Linrose soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Slaven Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Linrose Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Slaven soil—VIIs, nonirrigated; Linrose soil—VIIe, nonirrigated; Cleavage soil—VIIs, nonirrigated

*Range site:* Slaven soil—024X029N; Linrose soil—024X042N; Cleavage soil—024X027N

## **1202—Slaven-Wiskan-Graley Variant association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,300 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 90 days

### **Composition**

#### **Major components:**

- Slaven very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—35 percent

- Wiskan gravelly loam, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—30 percent

- Graley Variant very gravelly loam, 15 to 50 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—20 percent

#### **Contrasting inclusions:**

- Inclusion 1: Glean gravelly silt loam, 30 to 50 percent

slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—8 percent

- Inclusion 2: Cleavage very gravelly loam, 15 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 3: Rock outcrop—2 percent

### **Characteristics of the Slaven Soil**

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum influenced by loess; source—chert, shale, and quartzite

### **Typical Profile**

- 0 to 4 inches—very gravelly loam; 55 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2
- 4 to 22 inches—extremely gravelly clay, extremely gravelly sandy clay, extremely gravelly clay loam; 0 to 15 percent cobbles and stones and 75 to 85 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 22 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.9 to 2.5 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Wiskan Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—thin loess mantle over residuum and colluvium; source—chert and other various kinds of rock

*Slope features:* Length—long; shape—concave to slightly convex

*Dominant present vegetation:* Black sagebrush, bluebunch wheatgrass

### **Typical Profile**

- 0 to 16 inches—gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); granular structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, CL-ML, SM-SC, ML; estimated AASHTO classification—A-4
- 16 to 28 inches—very gravelly clay loam, very gravelly loam, extremely gravelly clay loam; 10 to 25 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 28 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.4 to 3.0 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Graley Variant Soil**

*Position on landscape:* Ridges and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—chert

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

### **Typical Profile**

- 0 to 7 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than

2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1

7 to 15 inches—very gravelly clay loam, very gravelly clay; 10 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.2 to 2.1 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave, north-facing pockets on side slopes of mountains

*Contrasting features:* Additional moisture from drifted snow

*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush

#### **Inclusion 2**

*Position on landscape:* Windswept crests of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Black sagebrush, low sagebrush

#### **Inclusion 3**

*Position on landscape:* Random small peaks, ridges, and rimrock of mountains

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Slaven soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Wiskan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Graley Variant soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Slaven Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Wiskan Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Graley Variant Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, too clayey, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Slaven soil—VIIs, nonirrigated; Wiskan soil—VIIe, nonirrigated; Graley Variant soil—VIIs, nonirrigated

*Range site:* Slaven soil—024X029N; Wiskan soil—024X031N; Graley Variant soil—024X028N

## 1203—Slaven-Glean-Cleavage association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,500 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 80 days

### Composition

*Major components:*

- Slaven very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—35 percent
- Glean gravelly loam, 30 to 50 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—30 percent
- Cleavage very gravelly loam, 15 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—20 percent

*Contrasting inclusions:*

- Inclusion 1: Hapgood very gravelly loam, 50 to 75 percent slopes—Pachic Cryoborolls, loamy-skeletal, mixed—8 percent
- Inclusion 2: Cleavage extremely gravelly loam, 8 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—4 percent
- Inclusion 3: Sumine extremely gravelly loam, 30 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—3 percent

### Characteristics of the Slaven Soil

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium influenced by loess; source—chert, shale, and quartzite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, Douglas rabbitbrush, bluebunch wheatgrass, Idaho fescue

*Surface cover:* 45 percent pebbles, 5 percent cobbles

### Typical Profile

- 0 to 4 inches—very gravelly loam; 55 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2
- 4 to 22 inches—extremely gravelly clay, extremely gravelly sandy clay, extremely gravelly clay loam; 0 to 15 percent cobbles and stones and 75 to 85 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.2); nonsaline

(less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

22 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.5 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Glean Soil

*Position on landscape:* North- and west-facing side slopes and snow pockets on mountains

*Parent material:* Kind—gravelly colluvium and residuum; source—various kinds of rock

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Mountain big sagebrush, snowberry, lanceleaf rabbitbrush, Idaho fescue, bluegrass

### Typical Profile

- 0 to 6 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4
- 6 to 49 inches—very gravelly loam, very gravelly sandy loam; 0 to 25 percent cobbles and stones and 40 to 75 percent pebbles (by weight); massive; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 49 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.1 to 5.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—3; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Cleavage Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Douglas rabbitbrush, Sandberg bluegrass, bluebunch wheatgrass

### **Typical Profile**

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2, A-4, A-6

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 25 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave, higher snow pockets of mountains

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Mountain big sagebrush, snowberry, Sandberg bluegrass

#### **Inclusion 2**

*Position on landscape:* Convex, windswept, narrow crests of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Low sagebrush, black sagebrush, Sandberg bluegrass, Idaho fescue

#### **Inclusion 3**

*Position on landscape:* Convex, lower, south-facing side slopes of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Mountain big sagebrush, Douglas rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Slaven soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Glean soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Slaven Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Glean Soil for Selected Uses**

*Range seeding:* Fair—droughty, small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope, seepage  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—large stones

#### **Interpretive Groups**

*Capability classification:* Slaven soil—VIIIs, nonirrigated;  
 Glean soil—VIIe, nonirrigated; Cleavage soil—VIIIs,  
 nonirrigated  
*Range site:* Slaven soil—024X029N; Glean soil—  
 024X023N; Cleavage soil—024X027N

### **1212—Wiskan-Roca-Bregar association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,000 to 7,300 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 43 degrees F  
*Frost-free season:* About 90 days

#### **Composition**

##### *Major components:*

- Wiskan gravelly silt loam, 15 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—40 percent
  - Roca extremely cobbly sandy clay loam, 15 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—30 percent
  - Bregar extremely gravelly sandy loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—15 percent
- Contrasting inclusions:*
- Inclusion 1: Linrose extremely stony loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 2: Locane gravelly very fine sandy loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-

skeletal, montmorillonitic, frigid—5 percent  
 • Inclusion 3: Aridic Haploxerolls, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent

#### **Characteristics of the Wiskan Soil**

*Position on landscape:* North- and east-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium with a thin loess mantle; source—chert and various kinds of rock  
*Slope features:* Length—short; shape—smooth to slightly convex  
*Dominant present vegetation:* Black sagebrush, bluebunch wheatgrass

#### **Typical Profile**

0 to 16 inches—gravelly silt loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); granular structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4  
 16 to 28 inches—very gravelly clay loam, very gravelly loam, extremely gravelly clay loam; 10 to 25 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 28 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.6 to 3.2 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

#### **Characteristics of the Roca Soil**

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—shale and chert

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, bluebunch wheatgrass

### Typical Profile

0 to 5 inches—extremely cobbly sandy clay loam; 50 to 65 percent cobbles and stones or 60 to 75 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

5 to 27 inches—very gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

27 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.8 to 3.5 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Characteristics of the Bregar Soil

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex to smooth

*Dominant present vegetation:* Black sagebrush, bluebunch wheatgrass, low sagebrush

### Typical Profile

0 to 4 inches—extremely gravelly sandy loam; 10 to 20 percent cobbles and stones and 70 to 80 percent pebbles (by weight); platy structure; soft, very

friable; slightly acid (pH 6.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GP-GM, GP-GC, GM; estimated AASHTO classification—A-1, A-2

4 to 11 inches—very gravelly clay loam, extremely gravelly loam, very cobbly sandy clay loam; 0 to 40 percent cobbles and stones and 65 to 80 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

11 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 5 to 12 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.0 to 1.3 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave, north-facing, colluvial back slopes of mountains

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Black sagebrush, Idaho fescue

#### Inclusion 2

*Position on landscape:* Low elevation, south- and west-facing side slopes of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

#### Inclusion 3

*Position on landscape:* North-facing snow pockets on concave back slopes of mountains

*Contrasting features:* Receives additional soil moisture from drifted snow

*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat



**Wildlife habitat elements:**

*Suitability of the Wiskan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Roca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Bregar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Wiskan Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Roca Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Bregar Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, rooting depth

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Wiskan soil—VIIe, nonirrigated; Roca soil—VIIs, nonirrigated; Bregar soil—VIIs, nonirrigated

*Range site:* Wiskan soil—024X031N; Roca soil—024X028N; Bregar soil—024X016N

**1215—Wiskan-Locane association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,300 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 42 degrees F

*Frost-free season:* About 80 days

**Composition****Major components:**

- Wiskan gravelly silt loam, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—60 percent
  - Locane very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—25 percent
- Contrasting inclusions:**
- Inclusion 1: Cleavage extremely cobbly loam, 15 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 2: Glean gravelly silt loam, 30 to 50 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 3: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—5 percent

**Characteristics of the Wiskan Soil**

*Position on landscape:* Convex side slopes of mountains

*Parent material:* Kind—residuum with a thin loess mantle; source—chert, shale, and various other rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, bluebunch wheatgrass

**Typical Profile**

- 0 to 16 inches—gravelly silt loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); granular structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML, SM-SC, CL-ML; estimated AASHTO classification—A-4
- 16 to 28 inches—very gravelly clay loam, very gravelly loam, extremely gravelly clay loam; 10 to 25 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0);

nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

28 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.6 to 3.2 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Locane Soil

*Position on landscape:* Concave side slopes of mountains

*Parent material:* Kind—residuum; source—shale and conglomerate

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Big sagebrush, bluebunch wheatgrass

### Typical Profile

0 to 6 inches—very gravelly loam; 5 to 15 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

6 to 14 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.4 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—Moderate; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex, windswept crests of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Low sagebrush, black sagebrush, bluegrass

#### Inclusion 2

*Position on landscape:* Concave, north-facing snow pockets on side slopes of mountains

*Contrasting features:* Receives additional moisture from drifted snow

*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue

#### Inclusion 3

*Position on landscape:* Lower side slopes of mountains

*Contrasting features:* Clayey subsoil

*Distinctive present vegetation:* Black sagebrush, bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Wiskan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Locane soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Wiskan Soil for Selected Uses

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Locane Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Wiskan soil—VIIe, nonirrigated; Locane soil—VIIs, nonirrigated

*Range site:* Wiskan soil—024X031N; Locane soil—024X035N

## **1216—Wiskan-Linrose association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,400 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 42 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Wiskan very gravelly silt loam, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—60 percent
- Linrose gravelly silt loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—25 percent

*Contrasting inclusions:*

- Inclusion 1: Slaven very gravelly silt loam, 50 to 75 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—7 percent
- Inclusion 2: Rubble land—6 percent
- Inclusion 3: Bregar extremely gravelly loam, 8 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—2 percent

### **Characteristics of the Wiskan Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—a thin loess mantle over residuum and colluvium; source—chert

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, bluebunch wheatgrass

### **Typical Profile**

0 to 16 inches—very gravelly silt loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); granular structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

16 to 28 inches—very gravelly clay loam, very gravelly loam, extremely gravelly clay loam; 10 to 25 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

28 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.4 to 3.0 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Linrose Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—chert, shale, and quartzite

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Black sagebrush, Idaho fescue

### **Typical Profile**

0 to 8 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, ML; estimated AASHTO classification—A-4

8 to 26 inches—very gravelly loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2  
26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 3.6 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex, south-facing side slopes of mountains

*Contrasting features:* Very gravelly clay subsoil

*Distinctive present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

#### Inclusion 2

*Position on landscape:* Rock screes on side slopes of mountains

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

#### Inclusion 3

*Position on landscape:* Crests of lower elevation parts of mountains

*Contrasting features:* Bedrock within a depth of 20 inches

*Distinctive present vegetation:* Black sagebrush, low sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Wiskan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Linrose soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Wiskan Soil for Selected Uses

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Linrose Soil for Selected Uses

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Wiskan soil—VIIIs, nonirrigated; Linrose soil—VIIe, nonirrigated

*Range site:* Wiskan soil—024X031N; Linrose soil—024X042N

## 1220—Boulflat-Havingdon-Dewar association

### Map Unit Setting

*Position on landscape:* Foothills

*Elevation:* 5,000 to 5,500 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Boulflat gravelly loam, 4 to 30 percent slopes—Haploxerollic Durargids, fine-loamy, mixed, mesic—40 percent
- Havingdon gravelly silt loam, 15 to 30 percent

slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—30 percent

- Dewar cobbly loam, 4 to 30 percent slopes—Xerollic Durargids, loamy, mixed, mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Humdun silt loam, 4 to 30 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, frigid—5 percent
- Inclusion 2: Rock outcrop—5 percent

### **Characteristics of the Boulflat Soil**

*Position on landscape:* North- and east-facing side slopes of foothills

*Parent material:* Kind—residuum and colluvium influenced by loess; source—chert, shale, and quartzite

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass, bluebunch wheatgrass

### **Typical Profile**

0 to 6 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

6 to 23 inches—gravelly clay loam, gravelly loam, gravelly sandy clay loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

23 to 32 inches—strongly cemented duripan; massive  
32 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 20 to 34 inches

*Depth to bedrock:* 22 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.4 to 4.1 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Havingdon Soil**

*Position on landscape:* South- and west-facing side slopes of foothills

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—chert and shale

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Sandberg bluegrass

### **Typical Profile**

0 to 3 inches—gravelly silt loam; 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-4

3 to 22 inches—very gravelly clay, very gravelly sandy clay, extremely gravelly clay loam; 65 to 85 percent pebbles (by weight); massive; very hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

22 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 26 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.8 to 2.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Dewar Soil**

*Position on landscape:* Interhill fan remnants

*Parent material:* Loess and silty mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, littleleaf horsebrush

### **Typical Profile**

0 to 4 inches—cobbly loam; 15 to 40 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/

cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

4 to 14 inches—cobbly silty clay loam; 25 to 30 percent cobbles and stones and 10 to 20 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

14 to 19 inches—very cobbly silt loam; 30 to 40 percent cobbles and stones and 45 to 55 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-6

19 to 32 inches or more—indurated duripan; massive; extremely hard, extremely firm

32 to 60 inches or more—gravelly sandy loam; 40 to 50 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 13 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.4 to 2.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* North-facing colluvial foot slopes of foothills

*Contrasting features:* Lacks layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, littleleaf horsebrush

#### Inclusion 2

*Position on landscape:* Random small peaks of foothills, ridges, and rimrock

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Boulflat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Havingdon soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Dewar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Boulflat Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope, seepage

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Havingdon Soil for Selected Uses

*Range seeding:* Poor—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Dewar Soil for Selected Uses

*Range seeding:* Fair—large stones, droughty, erodes easily

*Daily cover for landfill:* Poor—cemented pan, slope

*Shallow excavations:* Severe—cemented pan, slope

*Local roads and streets:* Severe—cemented pan, slope

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, cemented pan, slope

*Pond reservoir areas:* Severe—seepage, cemented pan, slope

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Boulflat soil—V1e, nonirrigated;

Havingdon soil—VIIe, nonirrigated; Dewar soil—VIIIs, nonirrigated

*Range site:* Boulflat soil—024X005N; Havingdon soil—024X035N; Dewar soil—024X005N

## 1221—Boulflat-Colbar-Old Camp association

### Map Unit Setting

*Position on landscape:* Foothills

*Elevation:* 5,300 to 5,900 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Boulflat gravelly loam, 4 to 15 percent slopes—Haploxerollic Durargids, fine-loamy, mixed, mesic—50 percent
- Colbar gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—20 percent
- Old Camp very cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—7 percent
- Inclusion 2: Typic Camborthids, 8 to 15 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Typic Haplargids, 8 to 15 percent slopes—Typic Haplargids, fine, montmorillonitic, mesic—3 percent

### Characteristics of the Boulflat Soil

*Position on landscape:* Crests and broad side slopes of foothills

*Parent material:* Kind—residuum and colluvium influenced by loess; source—chert

*Slope features:* Length—short; shape—smooth to convex

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, Indian ricegrass, Thurber needlegrass

### Typical Profile

0 to 6 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

6 to 23 inches—gravelly clay loam, gravelly loam, gravelly sandy clay loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

23 to 32 inches—strongly cemented duripan; massive

32 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 20 to 34 inches

*Depth to bedrock:* 22 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.4 to 4.1 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Colbar Soil

*Position on landscape:* North- and east-facing side slopes of foothills

*Parent material:* Kind—residuum and colluvium; source—andesite, dacite, and tuff

*Slope features:* Length—long; shape—smooth to concave

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, Indian ricegrass, Thurber needlegrass

### Typical Profile

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC, SM, GM; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30

percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4 26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Old Camp Soil

*Position on landscape:* Several dissected side slope areas of foothills  
*Parent material:* Kind—residuum influenced by volcanic ash; source—basalt and andesite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, small rabbitbrush

### Typical Profile

0 to 2 inches—very cobbly loam; 25 to 55 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, GM-GC, SM-SC; estimated AASHTO classification—A-4, A-2  
 2 to 14 inches—very stony loam, very cobbly loam, very cobbly clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6  
 14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.5 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave drainageways of foothills  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### Inclusion 2

*Position on landscape:* Convex, lower side slopes of foothills and summits of adjacent dissected rock pediment remnants  
*Contrasting features:* Bedrock at a depth of more than 40 inches  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Convex dissected ridges and side slopes of foothills  
*Contrasting features:* Deep soils with a clayey subsoil  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Boulflat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Boulflat Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty  
*Daily cover for landfill:* Poor—depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock



*Local roads and streets:* Moderate—slope, depth to bedrock, frost action

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Fair—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, small stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope, large stones

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones, depth to bedrock

#### **Interpretive Groups**

*Capability classification:* Boulflat soil—IVe, irrigated, and VIs, nonirrigated; Colbar soil—Vle, nonirrigated; Old Camp soil—VIIIs, nonirrigated

*Range site:* Boulflat soil—024X005N; Colbar soil—024X005N; Old Camp soil—024X005N

### **1240—Redflame-Kingingham association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 5,200 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

##### *Major components:*

- Redflame very gravelly loam, 4 to 15 percent slopes—Duric Haplargids, loamy-skeletal, mixed, mesic—55 percent

- Kingingham gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Nadurargids, fine montmorillonitic, mesic—30 percent

##### *Contrasting inclusions:*

- Inclusion 1: Duric Natrargids, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—7 percent

- Inclusion 2: Xerollic Haplargids, 2 to 8 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—4 percent

- Inclusion 3: Typic Camborthids, 15 to 30 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—4 percent

#### **Characteristics of the Redflame Soil**

*Position on landscape:* Fan aprons

*Parent material:* Gravelly mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, littleleaf horsebrush

*Surface cover:* 60 percent pebbles, 5 percent cobbles

#### **Typical Profile**

0 to 5 inches—very gravelly loam; 0 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2

5 to 14 inches—very gravelly clay loam, very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

14 to 60 inches or more—very gravelly sandy loam; 5 to 10 percent cobbles and stones and 55 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* In the upper 14 inches—moderately slow; below this depth—moderately rapid  
*Available water capacity:* 2.7 to 4.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Kingingham Soil**

*Position on landscape:* Summits of nonburied fan piedmont remnants  
*Parent material:* Thin loess mantle over mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4  
 7 to 22 inches—gravelly clay loam, gravelly clay, gravelly silty clay loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7  
 22 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 3.5 to 4.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow to medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower fan piedmont remnants  
*Contrasting features:* Silty clay loam subsoil  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Side slopes of fan piedmont remnants adjacent to deep channels  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 3**

*Position on landscape:* Inset fans  
*Contrasting features:* Slopes of 15 to 30 percent  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Redflame soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Kingingham soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Redflame Soil for Selected Uses**

*Range seeding:* Poor—too arid, small stones  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—slope  
*Local roads and streets:* Moderate—slope  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Seepage, slope  
*Embankments, dikes, and levees:* Slight

#### **Ratings of the Kingingham Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium  
*Daily cover for landfill:* Poor—cemented pan, hard to pack  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Poor—cemented pan, low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, too clayey  
*Pond reservoir areas:* Moderate—cemented pan, slope  
*Embankments, dikes, and levees:* Severe—thin layer, excess sodium

### **Interpretive Groups**

*Capability classification:* Redflame soil—VIIIs, nonirrigated; Kingingham soil—VIIIs, nonirrigated  
*Range site:* Redflame soil—024X002N; Kingingham soil—024X002N

## **1263—Graley-Loncan-Bregar association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,700 to 7,400 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 90 days

### **Composition**

#### *Major components:*

- Graley very gravelly sandy loam, 30 to 50 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—40 percent
- Loncan gravelly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—25 percent
- Bregar extremely gravelly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Glean gravelly silt loam, 30 to 75 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—7 percent
- Inclusion 2: Wiskan very gravelly silt loam, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—6 percent
- Inclusion 3: Rock outcrop—2 percent

### **Characteristics of the Graley Soil**

*Position on landscape:* South- and west-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—quartzite  
*Slope features:* Length—long; shape—concave to convex  
*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass  
*Surface cover:* 30 percent pebbles, 5 percent cobbles

### **Typical Profile**

0 to 7 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones and 50 to 75 percent pebbles

(by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

7 to 14 inches—very gravelly clay, very gravelly clay loam; 0 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.3 to 1.8 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—Low  
*Potential frost action:* Moderate

### **Characteristics of the Loncan Soil**

*Position on landscape:* North- and east-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—volcanic rocks and sedimentary rocks  
*Slope features:* Length—long; shape—concave to convex  
*Dominant present vegetation:* Mountain big sagebrush, Idaho fescue, snowberry

### **Typical Profile**

0 to 14 inches—gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6

14 to 31 inches—very gravelly loam, extremely cobbly loam, very gravelly sandy clay loam; 10 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—GC; estimated AASHTO  
classification—A-2

31 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 21 to 38 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.3 to 3.8 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—  
2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Bregar Soil

*Position on landscape:* Crests of mountains

*Parent material:* Kind—residuum; source—extrusive  
volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, low  
sagebrush, bluebunch wheatgrass

### Typical Profile

0 to 4 inches—extremely gravelly loam; 10 to 20  
percent cobbles and stones and 70 to 80 percent  
pebbles (by weight); platy structure; soft, very  
friable; mildly alkaline (pH 7.4); nonsaline (less than  
2 mmhos/cm); nonsodic (SAR less than 2);  
estimated Unified classification—GM-GC, GC;  
estimated AASHTO classification—A-2

4 to 11 inches—very gravelly clay loam, very cobbly  
sandy clay loam, extremely gravelly sandy clay  
loam; 5 to 45 percent cobbles and stones and 65 to  
75 percent pebbles (by weight); angular blocky  
structure; slightly hard, very friable; mildly alkaline  
(pH 7.4); nonsaline (less than 2 mmhos/cm);  
nonsodic (SAR less than 2); estimated Unified  
classification—GC; estimated AASHTO  
classification—A-2

11 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 5 to 12 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 0.9 to 1.2 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—  
1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave, north-facing back  
slopes of mountains

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Idaho fescue, mountain  
big sagebrush

#### Inclusion 2

*Position on landscape:* Convex protected crests of  
mountains

*Contrasting features:* Bedrock at a depth of 20 to 40  
inches

*Distinctive present vegetation:* Black sagebrush,  
bluebunch wheatgrass

#### Inclusion 3

*Position on landscape:* Random small peaks, ridges,  
and rimrock of mountains

*Contrasting features:* Bedrock exposed at the soil  
surface

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Graley soil for named elements:* Wild  
herbaceous plants (nonirrigated)—fair; shrubs  
(nonirrigated)—fair

*Suitability of the Loncan soil for named elements:* Wild  
herbaceous plants (nonirrigated)—fair; shrubs  
(nonirrigated)—fair

*Suitability of the Bregar soil for named elements:* Wild  
herbaceous plants (nonirrigated)—fair; shrubs  
(nonirrigated)—fair

#### Ratings of the Graley Soil for Selected Uses

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small  
stones, too clayey

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock,  
slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, depth to bedrock, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Loncan Soil for Selected Uses**

*Range seeding:* Fair—droughty, erodes easily  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer, large stones

#### **Ratings of the Bregar Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Graley soil—VIIe, nonirrigated;  
 Loncan soil—VIIe, nonirrigated; Bregar soil—VIIs,  
 nonirrigated

*Range site:* Graley soil—024X029N; Loncan soil—  
 024X021N; Bregar soil—024X016N

### **1280—Ricert-Oxcorel-Whirlo association**

#### **Map Unit Setting**

*Position on landscape:* Piedmont slopes

*Elevation:* 5,000 to 5,300 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Ricert gravelly fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—55 percent
- Oxcorel gravelly fine sandy loam, 2 to 8 percent

slopes—Duric Natrargids, fine, montmorillonitic, mesic—20 percent

• Whirlo gravelly loam, 2 to 4 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—15 percent  
*Contrasting inclusions:*

• Inclusion 1: Xerollic Camborthids, 0 to 2 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—7 percent

• Inclusion 2: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, fine-loamy, mixed, mesic—3 percent

#### **Characteristics of the Ricert Soil**

*Position on landscape:* Summits and side slopes of lower fan piedmont remnants

*Parent material:* Mixed alluvium with a thin loess mantle

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 6 inches—gravelly fine sandy loam; 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-4, A-2

6 to 18 inches—loam, clay loam; 0 to 15 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.5); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

18 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; very hard, very firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 18 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 4.4 to 6.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Slightly dissected summits of higher fan piedmont remnants  
*Parent material:* Loess over mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4, A-2  
 5 to 36 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7  
 36 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 36 inches—very slow; below this depth—moderately rapid  
*Available water capacity:* 4.8 to 6.7 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Whirlo Soil**

*Position on landscape:* Inset fans and fan skirts  
*Parent material:* Mixed alluvium influenced by loess  
*Slope features:* Length—short; smooth to slightly convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, rabbitbrush

### **Typical Profile**

0 to 12 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, GM; estimated AASHTO classification—A-4  
 12 to 24 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1  
 24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.7 to 5.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Upper parts of inset fans and adjacent to channels  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, small rabbitbrush

**Inclusion 2**

*Position on landscape:* Smooth to slightly convex fan aprons

*Contrasting features:* Lacks sodium-affected layer, receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Ricert soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Ricert Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess sodium, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

**Ratings of the Oxcorel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—excess sodium

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

**Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—small stones, seepage

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Ricert soil—IVe, irrigated, and VIIs, nonirrigated; Oxcorel soil—IVe, irrigated, and VIIs, nonirrigated; Whirlo soil—IIe, irrigated, and VIIc, nonirrigated

*Range site:* Ricert soil—024X002N; Oxcorel soil—024X002N; Whirlo soil—024X002N

**1281—Ricert-Whirlo-Pineval association****Map Unit Setting**

*Position on landscape:* Piedmont slopes

*Elevation:* 4,900 to 6,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition****Major components:**

- Ricert gravelly silt loam, 4 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—45 percent
- Whirlo fine sandy loam, 4 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—25 percent
- Pineval gravelly fine sandy loam, 4 to 8 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—15 percent

**Contrasting inclusions:**

- Inclusion 1: Duric Natrargids, 4 to 15 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—9 percent
- Inclusion 2: Xeric Torriorthents, 15 to 30 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—4 percent
- Inclusion 3: Typic Nadurargids, 4 to 15 percent slopes—Typic Nadurargids, fine-loamy, mixed, mesic—2 percent

**Characteristics of the Ricert Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Mixed alluvium with a thin loess mantle

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, cheatgrass

*Surface cover:* 30 percent pebbles, 5 percent cobbles

**Typical Profile**

- 0 to 6 inches—gravelly silt loam; 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4
- 6 to 18 inches—loam, clay loam; 0 to 15 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.5); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
- 18 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; very hard, very firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 18 inches—moderately slow; below this depth—moderately rapid  
*Available water capacity:* 4.4 to 6.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

**Characteristics of the Whirlo Soil**

*Position on landscape:* Inset fan remnants and fan skirts  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

**Typical Profile**

- 0 to 12 inches—fine sandy loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.1); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

- 12 to 24 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 15 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 4.8 to 6.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

**Characteristics of the Pineval Soil**

*Position on landscape:* Upper summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

**Typical Profile**

- 0 to 5 inches—gravelly fine sandy loam; 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2
- 5 to 11 inches—very gravelly loam, very gravelly clay loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2



11 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly sand; 0 to 25 percent cobbles and stones and 50 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.0 to 4.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex upper margins of fan piedmont remnants  
*Contrasting features:* Clayey, sodium-affected subsoil  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Convex side slopes of fan piedmont remnants  
*Contrasting features:* Slopes of 15 to 30 percent  
*Distinctive present vegetation:* Wyoming big sagebrush, shadscale

#### Inclusion 3

*Position on landscape:* Shoulder slopes of upper fan piedmont remnants  
*Contrasting features:* Duripan at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Ricert soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Whirlo soil for named elements:* Wild

herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Pineval soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Ricert Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### Ratings of the Whirlo Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Pineval Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty, small stones

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—area reclaim, small stones

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Ricert soil—IVe, irrigated, and VIIs, nonirrigated; Whirlo soil—IIIe, irrigated, and VIIc, nonirrigated; Pineval soil—IVe, irrigated, and VI, nonirrigated

*Range site:* Ricert soil—024X002N; Whirlo soil—024X002N; Pineval soil—028B010N

## 1283—Ricert-Kingingham-Oxcorel association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 4,700 to 5,200 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 50 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Ricert very fine sandy loam, 2 to 4 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—45 percent
  - Kingingham sandy loam, 2 to 4 percent slopes—Typic Nadurargids, fine, montmorillonitic, mesic—20 percent
  - Oxcorel silt loam, 2 to 4 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—20 percent
- Contrasting inclusions:*
- Inclusion 1: Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—6 percent
  - Inclusion 2: Duric Natrargids, 0 to 2 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—6 percent
  - Inclusion 3: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent

### Characteristics of the Ricert Soil

*Position on landscape:* Shoulders and upper side slopes of fan piedmont remnants

*Parent material:* Loess over mixed alluvium

*Slope features:* Length—short; shape—smooth to slightly concave

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

- 0 to 6 inches—very fine sandy loam; 0 to 10 percent cobbles and stones and 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
- 6 to 18 inches—loam, clay loam; 0 to 15 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
- 18 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to

80 percent pebbles (by weight); massive; very hard, very firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 18 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 4.5 to 6.6 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Characteristics of the Kingingham Soil

*Position on landscape:* Upper summits of fan piedmont remnants

*Parent material:* Loess over mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

- 0 to 7 inches—sandy loam; 0 to 5 percent cobbles and stones and 5 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 7 to 22 inches—gravelly clay loam, gravelly clay, gravelly silty clay loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 15 to 30); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7
- 22 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### Soil and Water Features

*Depth to hardpan:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 3.6 to 4.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow to medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Loess over mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—silt loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); platy structure; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 36 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

36 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 36 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 5.1 to 7.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Smooth inset fans and adjacent fan skirts

*Contrasting features:* Loamy, coarse textured throughout the profile

*Distinctive present vegetation:* Shadscale

#### **Inclusion 2**

*Position on landscape:* Foot slopes of fan piedmont remnants

*Contrasting features:* A strongly saline-sodic surface

*Distinctive present vegetation:* Shadscale, bud sagebrush, black greasewood

#### **Inclusion 3**

*Position on landscape:* Areas adjacent to active stream channels

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Ricert soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Kingingham soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Ricert Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

**Ratings of the Kingingham Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess salt

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—cemented pan, low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, too clayey

*Pond reservoir areas:* Moderate—cemented pan, slope

*Embankments, dikes, and levees:* Severe—excess sodium, thin layer

**Ratings of the Oxcorel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

**Interpretive Groups**

*Capability classification:* Ricert soil—IVe, irrigated, and VIIs, nonirrigated; Kingingham soil—VIIs, nonirrigated; Oxcorel soil—VIIs, nonirrigated

*Range site:* Ricert soil—024X002N; Kingingham soil—024X002N; Oxcorel soil—024X002N

**1291—Kingingham-Tenabo-Sodhouse association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,300 to 5,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Kingingham gravelly very fine sandy loam, 2 to 4 percent slopes—Typic Nadurargids, fine, montmorillonitic, mesic—40 percent
- Tenabo very fine sandy loam, 2 to 4 percent slopes—

Typic Nadurargids, loamy, mixed, mesic, shallow—30 percent

- Sodhouse gravelly very fine sandy loam, 4 to 8 percent slopes—Typic Durorthids, loamy, mixed, mesic, shallow—15 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Torriorthents, 15 to 30 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—7 percent

- Inclusion 2: Durixerollic Haplargids, 2 to 4 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—6 percent

- Inclusion 3: Xerollic Camborthids, 2 to 4 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—2 percent

**Characteristics of the Kingingham Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Mixed alluvium with a thin loess mantle

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

**Typical Profile**

0 to 7 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

7 to 22 inches—gravelly clay loam, gravelly clay, gravelly silty clay loam; 0 to 5 percent cobbles and stones and 30 to 40 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 15 to 35); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7

22 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

**Soil and Water Features**

*Depth to hardpan:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 3.5 to 4.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Characteristics of the Tenabo Soil**

*Position on landscape:* Upper summits of fan piedmont remnants  
*Parent material:* Mixed alluvium with a thin loess mantle high in volcanic ash  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 6 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4  
 6 to 18 inches—clay loam, gravelly clay loam, silty clay loam; 5 to 30 percent pebbles (by weight); prismatic structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 18 to 40 inches—indurated duripan; massive; extremely hard, extremely firm  
 40 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly coarse sand; 5 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); single grained; loose; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 9 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.8 to 4.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.55; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Characteristics of the Sodhouse Soil**

*Position on landscape:* Upper shoulder slopes of fan piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, small rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 5 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4, A-2  
 3 to 17 inches—fine sandy loam, loam, very fine sandy loam; 10 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4  
 17 to 29 inches—indurated duripan; massive  
 29 to 60 inches or more—extremely gravelly sandy loam, very gravelly loamy sand; 5 to 20 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.1 to 2.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Eroded escarpments of fan piedmont remnants adjacent to inset fans

*Contrasting features:* Very deep soils, lacks duripan  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Concave side slopes of fan piedmont remnants

*Contrasting features:* Very deep soils with a very gravelly subsoil

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Kingingham soil for named elements:*

Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Tenabo soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Sodhouse soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Kingingham Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—cemented pan, low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, too clayey, small stones

*Pond reservoir areas:* Moderate—cemented pan, slope

*Embankments, dikes, and levees:* Severe—excess sodium, thin layer

#### **Ratings of the Tenabo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—too sandy, cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, seepage

*Embankments, dikes, and levees:* Severe—excess sodium, seepage, excess salt

#### **Ratings of the Sodhouse Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, small stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—cemented pan, small stones, area reclaim

*Pond reservoir areas:* Severe—cemented pan, seepage

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Kingingham soil—VIIIs, nonirrigated; Tenabo soil—IVe, irrigated, and VIIIs, nonirrigated; Sodhouse soil—VIIIs, nonirrigated

*Range site:* Kingingham soil—024X002N; Tenabo soil—024X002N; Sodhouse soil—024X002N

## **1292—Kingingham-Golconda-Whirlo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,900 to 5,600 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Kingingham gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Nadurargids, fine, montmorillonitic, mesic—45 percent
- Golconda gravelly very fine sandy loam, 2 to 8 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—20 percent

- Whirlo gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Nadurargids, 8 to 15 percent slopes—Typic Nadurargids, clayey-skeletal, montmorillonitic, mesic—7 percent

- Inclusion 2: Durixerollic Camborthids, 2 to 4 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—6 percent
- Inclusion 3: Broyles very fine sandy loam, 2 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—2 percent

### **Characteristics of the Kingingham Soil**

*Position on landscape:* Upper summits, shoulders, and side slopes of fan piedmont remnants

*Parent material:* A thin loess mantle over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

*Surface cover:* 20 percent pebbles

### **Typical Profile**

- 0 to 7 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
- 7 to 22 inches—gravelly clay loam, gravelly clay, gravelly silty clay loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 20 to 40); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7
- 22 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 3.5 to 4.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow to medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of the Golconda Soil**

*Position on landscape:* Lower summits and side slopes of fan piedmont remnants

*Parent material:* Loess influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

- 0 to 10 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4
- 10 to 23 inches—clay loam, gravelly clay loam, silty clay loam; 10 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); strongly saline (16 to 30 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7
- 23 to 36 inches—strongly cemented duripan; massive; very hard, very firm
- 36 to 60 inches or more—stratified very gravelly loamy coarse sand to very gravelly sandy loam; 50 to 75 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 4.2 to 5.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of the Whirlo Soil**

*Position on landscape:* Inset fans and fan aprons

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

**Typical Profile**

0 to 12 inches—gravelly very fine sandy loam; 25 to 45 percent pebbles (by weight); platy; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

12 to 24 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1

24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.8 to 5.2 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Concave, slightly dissected side slopes of fan piedmont remnants

*Contrasting features:* Sodium-affected layer of clay accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 2**

*Position on landscape:* Concave upper inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 3**

*Position on landscape:* Slightly convex adjacent fan skirts

*Contrasting features:* Fine sandy loam throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Kingingham soil for named elements:*

Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Golconda soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Kingingham Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess salt

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—cemented pan, low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, too clayey

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer, excess sodium

**Ratings of the Golconda Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—cemented pan, seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—cemented pan, seepage

*Embankments, dikes, and levees:* Severe—excess sodium, seepage, excess salt

**Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt



*Daily cover for landfill:* Poor—seepage, small stones  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—small stones, area reclaim, excess salt  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Kingingham soil—VIIIs, nonirrigated; Golconda soil—IVe, irrigated, and VIIIs, nonirrigated; Whirlo soil—IIIe, irrigated, and VIIC, nonirrigated  
*Range site:* Kingingham soil—024X002N; Golconda soil—024X002N; Whirlo soil—024X002N

## **1293—Kingingham-Oxcorel association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,500 to 5,500 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Kingingham gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Nadurargids, fine, montmorillonitic, mesic—55 percent
- Oxcorel gravelly fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—30 percent

#### *Contrasting inclusions:*

- Inclusion 1: Durixerollic Haplargids, 2 to 8 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—6 percent
- Inclusion 2: Xeric Torriorthents, 2 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 3: Durorthidic Torriorthents, 2 to 8 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—4 percent

### **Characteristics of the Kingingham Soil**

*Position on landscape:* Upper summits of fan piedmont remnants  
*Parent material:* Loess over mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4  
 7 to 22 inches—gravelly clay loam, gravelly clay, gravelly silty clay loam; 0 to 5 percent cobbles and stones and 30 to 40 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 15 to 30); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7  
 22 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 3.5 to 4.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Lower summits of fan piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, SC, GM-GC; estimated AASHTO classification—A-4, A-2  
 5 to 20 inches—clay, clay loam; 0 to 5 percent cobbles

and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

20 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 20 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 4.8 to 6.7 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly concave fan aprons

*Contrasting features:* Lacks a duripan

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Concave inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Inset fan remnants

*Contrasting features:* Loamy and very gravelly throughout the profile

*Distinctive present vegetation:* Shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Kingingham soil for named elements:*

Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

### Ratings of the Kingingham Soil for Selected Uses

*Range seeding:* Poor—too arid, rooting depth, excess salt

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—cemented pan, low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, too clayey

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer, excess sodium

### Ratings of the Oxcorel Soil for Selected Uses

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### Interpretive Groups

*Capability classification:* Kingingham soil—VIIIs, nonirrigated; Oxcorel soil—IVe, irrigated, and VIIIs, nonirrigated

*Range site:* Kingingham soil—024X002N; Oxcorel soil—024X002N

## 1294—Kingingham-Whirlo-Beoska association

### Map Unit Setting

*Position on landscape:* Piedmont slopes

*Elevation:* 4,500 to 5,700 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Kingingham gravelly very fine sandy loam, 2 to 4 percent slopes—Typic Nadurargids, fine, montmorillonitic, mesic—40 percent
- Whirlo fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—25 percent
- Beoska gravelly very fine sandy loam, 2 to 4 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—20 percent

#### Contrasting inclusions:

- Inclusion 1: Durixerollic Camborthids, 2 to 4 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—9 percent
- Inclusion 2: Creemon very gravelly fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—3 percent
- Inclusion 3: Durixerollic Haplargids, 2 to 4 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—3 percent

### Characteristics of the Kingingham Soil

*Position on landscape:* Upper summits of fan piedmont remnants

*Parent material:* Thin loess mantle over mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush

#### Typical Profile

- 0 to 7 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
- 7 to 22 inches—gravelly clay loam, gravelly clay, gravelly silty clay loam; 0 to 5 percent cobbles and stones and 30 to 40 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly to moderately sodic (SAR 20 to 46); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7
- 22 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

#### Soil and Water Features

*Depth to hardpan:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 3.5 to 4.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### Characteristics of the Whirlo Soil

*Position on landscape:* Fan skirts and lower inset fans

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush

#### Typical Profile

- 0 to 12 inches—fine sandy loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.1); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
- 12 to 24 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 4.9 to 6.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Beoska Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Loess mantled mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush

#### **Typical Profile**

0 to 13 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4

13 to 24 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 7.0 to 8.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Upper inset fans and fan aprons

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Lower margins of fan skirts

*Contrasting features:* Silty throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Fan drainageways

*Contrasting features:* Receives additional moisture from runoff and flash flooding

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Kingingham soil for named elements:*

Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Kingingham Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess salt

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—cemented pan, low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, too clayey

*Pond reservoir areas:* Moderate—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer, excess sodium

#### **Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

#### **Interpretive Groups**

*Capability classification:* Kingingham soil—VIIIs, nonirrigated; Whirlo soil—IIc, irrigated, and VIIc, nonirrigated; Beoska soil—IIIe, irrigated, and VIIs, nonirrigated

*Range site:* Kingingham soil—024X002N; Whirlo soil—024X002N; Beoska soil—024X002N

### **1342—Doowak, cobbly-Doowak-Veta association**

#### **Map Unit Setting**

*Position on landscape:* Inset fans

*Elevation:* 4,900 to 5,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### **Composition**

##### **Major components:**

- Doowak cobbly sandy loam, 0 to 2 percent slopes, occasionally flooded—Xeric Torriorthents, sandy-skeletal, mixed, mesic—30 percent
- Doowak very gravelly loamy sand, 0 to 2 percent slopes—Xeric Torriorthents, sandy-skeletal, mixed, mesic—30 percent
- Veta gravelly sandy loam, 0 to 2 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—30 percent

##### **Contrasting inclusions:**

- Inclusion 1: Xeric Torriorthents, 8 to 30 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 2: Xerollic Camborthids, 0 to 2 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

#### **Characteristics of the Doowak, Cobbly, Soil**

*Position on landscape:* Inset fans adjacent to channels

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Typical Profile**

0 to 6 inches—cobbly sandy loam; 15 to 25 percent cobbles and stones and 15 to 30 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-2

6 to 60 inches or more—stratified extremely gravelly sand to extremely gravelly loamy sand; 0 to 5 percent cobbles and stones and 75 to 90 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—February through June

*Permeability:* Very rapid

*Available water capacity:* 2.2 to 3.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### **Characteristics of the Doowak Soil**

*Position on landscape:* Lower inset fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 6 inches—very gravelly loamy sand; 5 to 10 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2);

estimated Unified classification—GM, GP-GM;  
estimated AASHTO classification—A-1

6 to 60 inches or more—stratified extremely gravelly sand to extremely gravelly loamy sand; 5 to 10 percent cobbles and stones and 75 to 90 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Very rapid  
*Available water capacity:* 1.9 to 3.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

#### **Characteristics of the Veta Soil**

*Position on landscape:* Upper inset fan remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass

#### **Typical Profile**

0 to 4 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
4 to 20 inches—very gravelly sandy loam, extremely gravelly loam; 10 to 30 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
20 to 60 inches or more—stratified extremely gravelly loamy sand to very gravelly loam; 10 to 25 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/

cm); nonsodic (SAR less than 5); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* 2.5 to 5.0 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Side slopes of inset fan remnants  
*Contrasting features:* Slopes of 8 to 30 percent  
*Distinctive present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

##### **Inclusion 2**

*Position on landscape:* Fanlettes from adjacent fan piedmonts  
*Contrasting features:* Subject to flash flooding  
*Distinctive present vegetation:* Wyoming big sagebrush

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Doowak, cobbly, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Doowak soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Veta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Doowak, Cobbly, Soil for Selected Uses**

*Range seeding:* Poor—droughty  
*Daily cover for landfill:* Poor—seepage, too sandy, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, too sandy

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Doowak Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, too sandy

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Veta Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Doowak, cobbly, soil—VIIw, nonirrigated; Doowak soil—VIIs, nonirrigated; Veta soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Doowak, cobbly, soil—024X041N; Doowak soil—024X020N; Veta soil—024X005N

### **1392—Rock outcrop-Loncan Variant-Glean association**

#### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,500 to 8,000 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 80 days

#### **Composition**

*Major components:*

- Rock outcrop—40 percent
- Loncan Variant gravelly silt loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—25 percent
- Glean gravelly sandy loam, 30 to 50 percent slopes—

Pachic Haploxerolls, loamy-skeletal, mixed, frigid—20 percent

*Contrasting inclusions:*

• Inclusion 1: Lithic Haploxerolls, 30 to 50 percent slopes—Lithic Haploxerolls, sandy-skeletal, mixed, frigid—10 percent

• Inclusion 2: Lithic Haploxerolls, 50 to 75 percent slopes—Lithic Haploxerolls, loamy-skeletal, mixed, frigid—3 percent

• Inclusion 3: Cleavage extremely gravelly silt loam, 15 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—2 percent

#### **Characteristics of Rock Outcrop**

*Position on landscape:* Rimrock on crests and peaks of mountains

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* None

#### **Characteristics of the Loncan Variant Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—chert

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, black sagebrush

#### **Typical Profile**

0 to 12 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, ML; estimated AASHTO classification—A-4

12 to 32 inches—very gravelly loam, extremely gravelly sandy loam; 10 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2

32 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 3.1 to 5.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Glean Soil**

*Position on landscape:* Back slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—various kinds of rock  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Idaho fescue, mountain big sagebrush

### **Typical Profile**

0 to 6 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4  
 6 to 49 inches—very gravelly loam, very gravelly sandy loam; 0 to 25 percent cobbles and stones and 40 to 75 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
 49 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.1 to 5.0 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—3; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Shoulders below peaks of mountains  
*Contrasting features:* Shallow to bedrock

*Distinctive present vegetation:* Singleleaf pinyon, mountain big sagebrush, bluegrass

#### **Inclusion 2**

*Position on landscape:* Shoulders below rimrock of mountains  
*Contrasting features:* Slopes of 50 to 75 percent  
*Distinctive present vegetation:* Black sagebrush, Idaho fescue

#### **Inclusion 3**

*Position on landscape:* Crests of mountains  
*Contrasting features:* Bedrock within a depth of 20 inches  
*Distinctive present vegetation:* Low sagebrush, black sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat  
*Site index for common trees on the Loncan Variant Soil:* Singleleaf pinyon—40; Utah Juniper—40  
*Most important native understory plants:* Black sagebrush, bluegrass

#### **Wildlife habitat elements:**

*Suitability of the Loncan Variant soil for named elements:*  
 Wild herbaceous plants (nonirrigated)—fair;  
 coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair  
*Suitability of the Glean soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

#### **Ratings of the Loncan Variant Soil for Selected Uses**

*Range seeding:* Poor—small stones, erodes easily  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Glean Soil for Selected Uses**

*Range seeding:* Fair—droughty, erodes easily  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope, seepage  
*Embankments, dikes, and levees:* Severe—seepage



### **Interpretive Groups**

*Capability classification:* Rock outcrop—VIIIs; Loncan Variant soil—VIIIs, nonirrigated; Glean soil—VIIe, nonirrigated

*Range site:* Loncan Variant soil—025X063; Glean soil—024X023N

*Woodland suitability group:* Loncan Variant soil—1r

## **1400—Koyunik, steep-Koyunik-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Low mountains and foothills

*Elevation:* 4,900 to 5,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Koyunik very cobbly very fine sandy loam, 30 to 50 percent slopes—Lithic Torriorthents, loamy-skeletal, carbonatic, mesic—40 percent
- Koyunik very gravelly very fine sandy loam, 15 to 30 percent slopes—Lithic Torriorthents, loamy-skeletal, carbonatic, mesic—30 percent
- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 8 to 30 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—8 percent
- Inclusion 2: Lithic Haplargids, 15 to 50 percent slopes—Lithic Haplargids, loamy, mixed, mesic—4 percent
- Inclusion 3: Typic Durorthids, 15 to 30 percent slopes—Typic Durorthids, loamy-skeletal, mixed, mesic—3 percent

### **Characteristics of the Koyunik, Steep, Soil**

*Position on landscape:* Side slopes of low mountains and foothills

*Parent material:* Kind—residuum; source—limestone and dolomite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, ephedra, little rabbitbrush, Sandberg bluegrass

*Surface cover:* 40 percent pebbles, 10 percent cobbles

### **Typical Profile**

0 to 6 inches—very cobbly very fine sandy loam; 45 to 60 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly

hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-2  
6 to 8 inches—very gravelly loam, very gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC, GC, SC; estimated AASHTO classification—A-2  
8 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 0.6 to 0.7 inches

*Water-supplying capacity:* 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Koyunik Soil**

*Position on landscape:* Crests and shoulder slopes of low mountains and foothills

*Parent material:* Kind—residuum; source—limestone and dolomite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, Sandberg bluegrass

### **Typical Profile**

0 to 6 inches—very gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, GM-GC, GM; estimated AASHTO classification—A-1, A-2

6 to 8 inches—very gravelly loam, very gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm);

nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC, GC, SC; estimated AASHTO classification—A-2  
8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 8 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 0.6 to 0.7 inches  
*Water-supplying capacity:* 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of Rock Outcrop

*Position on landscape:* Multiple ledges and locally exposed broad bedding planes on low mountains and foothills  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Irregular to concave, north-facing side slopes and foot slopes of foothills  
*Contrasting features:* Bedrock at a depth of more than 20 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### Inclusion 2

*Position on landscape:* Convex, shale bedrock side slope areas of foothills  
*Contrasting features:* Thin layer of clay accumulation above the bedrock  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Stable random areas on foothills  
*Contrasting features:* Duripan at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Koynik, steep, soil for named elements:*  
Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Koynik soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### Ratings of the Koynik, Steep, Soil for Selected Uses

*Range seeding:* Poor—too arid, droughty, large stones  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—large stones, thin layer

### Ratings of the Koynik Soil for Selected Uses

*Range seeding:* Poor—too arid, droughty, small stones  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Koynik, steep, soil—VIIIs, nonirrigated; Koynik soil—VIIIs, nonirrigated; Rock outcrop—VIIIs  
*Range site:* Koynik, steep, soil—024X002N; Koynik soil—024X002N

## 1410—Bojo-Stingdorn association

### Map Unit Setting

*Position on landscape:* Foothills  
*Elevation:* 5,000 to 6,000 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 90 days

### Composition

*Major components:*

- Bojo fine sandy loam, 8 to 30 percent slopes,

extremely stony—Lithic Haplargids, loamy, mixed, mesic—55 percent

- Stingdorn gravelly loam, 4 to 15 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—30 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—7 percent
- Inclusion 2: Typic Durorthids, 2 to 8 percent slopes—Typic Durorthids, loamy, mixed, mesic, shallow—4 percent
- Inclusion 3: Durixerollic Camborthids, 4 to 15 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—4 percent

### **Characteristics of the Bojo Soil**

*Position on landscape:* Higher elevation crests and side slopes of foothills

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, little rabbitbrush, littleleaf horsebrush, bottlebrush squirreltail

*Rock fragments on surface:* Kind—stones; percentage of surface covered—5

### **Typical Profile**

0 to 4 inches—fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

4 to 10 inches—sandy clay loam, clay loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6

10 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 7 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.3 to 1.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium to rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Stingdorn Soil**

*Position on landscape:* Broad, stable crests and lower elevation side slopes of foothills

*Parent material:* Kind—residuum; source—rhyolitic tuffs

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—gravelly loam; 5 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2, A-4

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC; estimated AASHTO classification—A-6

15 to 20 inches—indurated duripan

20 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 20 inches

*Depth to bedrock:* 8 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.7 to 2.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Broad, locally exposed bedrock rims of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

**Inclusion 2**

*Position on landscape:* Smooth summits of foothills

*Contrasting features:* Lacks a layer of clay accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 3**

*Position on landscape:* Concave drainageways of foothills

*Contrasting features:* Very deep soils, receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Bojo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Bojo Soil for Selected Uses**

*Range seeding:* Too arid, droughty, rooting depth

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Stingdorn Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty

*Daily cover for landfill:* Poor—depth to bedrock, large stones

*Shallow excavations:* Severe—depth to bedrock, cemented pan

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, large stones, cemented pan

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Bojo soil—VIIs, nonirrigated; Stingdorn soil—VIIs, nonirrigated

*Range site:* Bojo soil—024X020N; Stingdorn soil—024X002N

**1411—Bojo-Rock outcrop-Osoll association****Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Bojo gravelly sandy loam, 15 to 75 percent slopes, rubbly—Lithic Haplargids, loamy, mixed, mesic—50 percent

- Rock outcrop—20 percent

- Osoll gravelly loam, 15 to 30 percent slopes—Typic Durorthids, loamy-skeletal, mixed, mesic, shallow—15 percent

*Contrasting inclusions:*

- Inclusion 1: Duric Natrargids, 8 to 15 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—6 percent

- Inclusion 2: Duric Camborthids, 15 to 30 percent slopes—Duric Camborthids, loamy-skeletal, mixed, mesic—6 percent

- Inclusion 3: Colbar very gravelly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—3 percent

**Characteristics of the Bojo Soil**

*Position on landscape:* Side slopes of foothills

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—long; shape—irregularly shaped

*Dominant present vegetation:* Wyoming big sagebrush, little rabbitbrush, bottlebrush squirreltail, Sandberg bluegrass

*Rock fragments on surface:* Kind—stones; percentage of surface covered—5

**Typical Profile**

0 to 4 inches—gravelly sandy loam; 25 to 40 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

4 to 10 inches—sandy clay loam, clay loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH

8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6

10 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 7 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of Rock Outcrop**

*Position on landscape:* Steep cliffs on upper side slopes of foothills

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* None

### **Characteristics of the Osoll Soil**

*Position on landscape:* Predominantly south- and west-facing, lower, colluvial side slopes of foothills

*Parent material:* Kind—residuum and colluvium; source—tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, CL-ML; estimated AASHTO classification—A-4

5 to 12 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

12 to 35 inches—indurated duripan; platy structure; extremely hard, extremely firm

35 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 0.9 to 1.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly convex, lower side slopes and foot slopes of foothills

*Contrasting features:* Deep soil that has a sodium-affected subsoil layer

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Slightly convex, south-facing, lower side slopes and foot slopes of foothills

*Contrasting features:* Very deep

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Convex, north-facing, lower side slopes of foothills

*Contrasting features:* Bedrock at a depth of 20 to 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Bojo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Osoll soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Bojo Soil for Selected Uses**

*Range seeding:* Too arid, droughty, rooting depth

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Osoll Soil for Selected Uses**

*Range seeding:* Poor—too arid, erodes easily  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope  
*Local roads and streets:* Severe—slope, cemented pan  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope, cemented pan  
*Pond reservoir areas:* Severe—slope, cemented pan  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Bojo soil—VIIIs, nonirrigated;  
 Rock outcrop VIIIs; Osoll soil—VIIe, nonirrigated  
*Range site:* Bojo soil—024X020N; Osoll soil—024X002N

### **1412—Bojo-Humdun-Boulflat association**

#### **Map Unit Setting**

*Position on landscape:* Foothills  
*Elevation:* 4,800 to 5,500 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

#### **Composition**

##### *Major components:*

- Bojo very gravelly loam, 30 to 50 percent slopes—Lithic Haplargids, loamy, mixed, mesic—40 percent
- Humdun silt loam, gravelly substratum, 15 to 50 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, frigid—30 percent
- Boulflat gravelly loam, 15 to 30 percent slopes—Haploxerollic Durargids, fine-loamy, mixed, mesic—20 percent

##### *Contrasting inclusions:*

- Inclusion 1: Havingdon gravelly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent
- Inclusion 2: Xeric Torriorthents, 15 to 30 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—4 percent
- Inclusion 3: Xerollic Haplargids, 2 to 8 percent

slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—1 percent

#### **Characteristics of the Bojo Soil**

*Position on landscape:* South-facing side slopes of foothills

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, Wyoming big sagebrush, bottlebrush squirreltail

*Rock fragments on surface:* Kind—stones; percentage of surface covered—5

#### **Typical Profile**

0 to 5 inches—very gravelly loam; 10 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

5 to 8 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones and 15 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC, CL; estimated AASHTO classification—A-7

8 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 5 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.3 to 1.5 inches

*Water-supplying capacity:* 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### **Characteristics of the Humdun Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—loess influenced by volcanic ash over residuum; source—volcanic rock

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass, Sandberg bluegrass

### Typical Profile

- 0 to 6 inches—silt loam; platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 6 to 24 inches—loam, very fine sandy loam, silt loam; massive; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 24 to 41 inches—loam, very fine sandy loam, silt loam; massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 41 to 60 inches or more—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 10.3 to 12.1 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Boulflat Soil

*Position on landscape:* Crest and shoulder slopes of foothills  
*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—chert, shale, and quartzite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass, Sandberg bluegrass

### Typical Profile

- 0 to 6 inches—gravelly loam; 25 to 50 percent pebbles (by weight); granular structure; soft, very friable;

mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

- 6 to 23 inches—gravelly clay loam, gravelly loam, gravelly sandy clay loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

- 23 to 32 inches—strongly cemented duripan  
 32 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 20 to 34 inches  
*Depth to bedrock:* 22 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.4 to 4.1 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper, south-facing side slopes of foothills

*Contrasting features:* Clayey layer of clay accumulation  
*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

#### Inclusion 2

*Position on landscape:* Incipient drainageways on north-facing side slopes of foothills

*Contrasting features:* Very deep soils that have gravelly sandy loam throughout the profile  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Canyon foot slopes between foothills

*Contrasting features:* Very deep soils, receives additional moisture from runoff  
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Bojo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Humdun soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Boulflat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Bojo Soil for Selected Uses**

*Range seeding:* Too arid, droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Humdun Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—seepage

**Ratings of the Boulflat Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope, seepage

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Bojo soil—VIIs, nonirrigated; Humdun soil—VIIe, nonirrigated; Boulflat soil—VIe, nonirrigated

*Range site:* Bojo soil—024X026N; Humdun soil—024X005N; Boulflat soil—024X005N

**1420—Sumine-Reluctan-Cleavage association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,200 to 7,400 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 80 days

**Composition**

*Major components:*

- Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—40 percent
  - Reluctan very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—30 percent
  - Cleavage very cobbly loam, 15 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—15 percent
- Contrasting inclusions:*
- Inclusion 1: Softscrabble cobbly loam, 4 to 15 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—9 percent
  - Inclusion 2: Lithic Xerollic Haplargids, 2 to 8 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—3 percent
  - Inclusion 3: Rock outcrop—2 percent
  - Inclusion 4: Rubble land—1 percent

**Characteristics of the Sumine Soil**

*Position on landscape:* Predominantly south-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—quartzite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, pine bluegrass, bottlebrush squirreltail

**Typical Profile**

0 to 10 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8);



nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7  
30 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.8 to 4.1 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Reluctant Soil

*Position on landscape:* Predominantly north-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—rhyolitic rock  
*Slope features:* Length—long; shape—smooth to slightly concave  
*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail

### Typical Profile

0 to 8 inches—very gravelly loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4, A-2  
8 to 33 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7  
33 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 4.0 to 5.2 inches

*Water-supplying capacity:* 12 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Cleavage Soil

*Position on landscape:* Crests, shoulders, and upper side slopes of mountains  
*Parent material:* Kind—residuum; source—extrusive volcanic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, black sagebrush, Sandberg bluegrass, bottlebrush squirreltail, phlox

### Typical Profile

0 to 4 inches—very cobbly loam; 30 to 45 percent cobbles and stones and 35 to 55 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2, A-4, A-6  
4 to 15 inches—extremely cobbly sandy clay loam, very gravelly clay loam, very cobbly clay loam; 25 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.6 to 1.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave, incipient drainageways of mountains

*Contrasting features:* Thick, dark colored surface layer, higher water-supplying capacity

*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue, bluebunch wheatgrass

#### **Inclusion 2**

*Position on landscape:* Smooth to slightly convex, lower crests of mountains

*Contrasting features:* Shallow soils that have a thin surface layer

*Distinctive present vegetation:* Black sagebrush, pine bluegrass

#### **Inclusion 3**

*Position on landscape:* Random small peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 4**

*Position on landscape:* Rock stripes on mountain side slopes below rock outcrop

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Reluctan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Reluctan Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Sumine soil—VIIIs, nonirrigated; Reluctan soil—VIIIs, nonirrigated; Cleavage soil—VIIIs, nonirrigated

*Range site:* Sumine soil—024X029N; Reluctan soil—024X021N; Cleavage soil—024X016N

## **1421—Sumine-Softscrabble-Walti association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,400 to 7,200 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Sumine very cobbly loam, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—35 percent

- Softscrabble cobbly loam, 30 to 50 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—25 percent

- Walti very cobbly loam, 8 to 15 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—25 percent

*Contrasting inclusions:*

- Inclusion 1: Rubble land—6 percent
- Inclusion 2: Lithic Xerollic Haplargids, 4 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 3: Rock outcrop—4 percent

**Characteristics of the Sumine Soil**

*Position on landscape:* North- and west-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—quartzite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, Sandberg bluegrass, bluebunch wheatgrass

**Typical Profile**

0 to 10 inches—very cobbly loam; 30 to 55 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly clay loam, very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.5 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

**Characteristics of the Softscrabble Soil**

*Position on landscape:* East-facing side slopes and snow pockets on mountains

*Parent material:* Kind—colluvium and residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Sandberg bluegrass, Idaho fescue, Thurber needlegrass

**Typical Profile**

0 to 16 inches—cobbly loam; 25 to 40 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

16 to 30 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

30 to 60 inches or more—very gravelly clay loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.3 to 8.4 inches

*Water-supplying capacity:* 14 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

**Characteristics of the Walti Soil**

*Position on landscape:* Crest and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—rhyolite, tuffs, and quartzite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, Idaho fescue

**Typical Profile**

- 0 to 4 inches—very cobbly loam; 30 to 40 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
- 4 to 10 inches—gravelly clay loam, clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 10 to 30 inches—clay; gravelly clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); prismatic structure; very hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7
- 30 inches—unweathered bedrock

**Soil and Water Features**

- Depth to bedrock:* 20 to 30 inches
- Depth to seasonal high water table:* More than 60 inches
- Frequency of flooding:* None
- Permeability:* Very slow
- Available water capacity:* 3.7 to 4.8 inches
- Water-supplying capacity:* 12 inches
- Runoff:* Rapid
- Hydrologic group:* D
- Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—8
- Hazard of erosion:* By water—slight; by wind—slight
- Shrink-swell potential:* High
- Corrosivity:* To steel—moderate; to concrete—low
- Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

- Position on landscape:* Rock stripes on side slopes of mountains
- Contrasting features:* More than 90 percent stones on the surface
- Distinctive present vegetation:* Barren

**Inclusion 2**

- Position on landscape:* Convex, lower crests and shoulder slopes of mountains
- Contrasting features:* Bedrock at a depth of 14 to 20 inches

*Distinctive present vegetation:* Low sagebrush, black sagebrush, small rabbitbrush

**Inclusion 3**

- Position on landscape:* Ridges, spurs, and cliffs of mountains
- Contrasting features:* Bedrock exposed at the soil surface
- Distinctive present vegetation:* Barren

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

- Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
- Suitability of the Softscrabble soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
- Suitability of the Walti soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Sumine Soil for Selected Uses**

- Range seeding:* Poor—large stones, erodes easily
- Daily cover for landfill:* Poor—depth to bedrock, small stones, slope
- Shallow excavations:* Severe—depth to bedrock, slope
- Local roads and streets:* Severe—slope
- Roadfill:* Poor—depth to bedrock, slope
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Poor—small stones, slope
- Pond reservoir areas:* Severe—slope
- Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Softscrabble Soil for Selected Uses**

- Range seeding:* Fair—erodes easily, large stones
- Daily cover for landfill:* Poor—small stones, slope
- Shallow excavations:* Severe—slope
- Local roads and streets:* Severe—slope
- Roadfill:* Poor—slope
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Poor—area reclaim, small stones, slope
- Pond reservoir areas:* Severe—slope
- Embankments, dikes, and levees:* Moderate—large stones

**Ratings of the Walti Soil for Selected Uses**

- Range seeding:* Poor—large stones
- Daily cover for landfill:* Poor—depth to bedrock, hard to pack
- Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—low strength, depth to bedrock, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Sumine soil—VIIIs, nonirrigated; Softscrabble soil—VIIIs, nonirrigated; Walti soil—VIIIs, nonirrigated

*Range site:* Sumine soil—024X029N; Softscrabble soil—024X021N; Walti soil—024X027N

## **1422—Sumine-Hapgood-Cleavage association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,300 to 8,500 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Sumine very cobbly loam, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—35 percent
  - Hapgood very gravelly loam, 50 to 75 percent slopes—Pachic Cryoborolls, loamy-skeletal, mixed—30 percent
  - Cleavage extremely gravelly loam, 15 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—20 percent
- Contrasting inclusions:*
- Inclusion 1: Glean gravelly silt loam, 50 to 75 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 2: Loncan extremely stony loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 3: Rock outcrop—4 percent
  - Inclusion 4: Cumulic Haploxerolls, 2 to 15 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, frigid—1 percent

### **Characteristics of the Sumine Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—quartzite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, Douglas rabbitbrush, bluebunch wheatgrass, Idaho fescue, arrowleaf balsamroot

### **Typical Profile**

0 to 10 inches—very cobbly loam; 30 to 55 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly clay loam, very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.5 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Hapgood Soil**

*Position on landscape:* Snow pockets and north-facing side slopes of mountains

*Parent material:* Kind—colluvium influenced by volcanic ash; source—extrusive volcanic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Mountain big sagebrush, snowberry, Sandberg bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 17 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles

(by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

17 to 40 inches—very gravelly loam; 5 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

40 to 60 inches or more—very cobbly loam, very gravelly loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 4.8 to 6.0 inches

*Water-supplying capacity:* 16 inches

*Runoff:* Very rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Cleavage Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, black sagebrush, Sandberg bluegrass, Idaho fescue

#### **Typical Profile**

0 to 4 inches—extremely gravelly loam; 0 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 0 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Slightly concave, lower snow pockets of mountains

*Contrasting features:* Thick, dark colored surface layer

*Distinctive present vegetation:* Mountain big sagebrush, snowberry, lanceleaf rabbitbrush

##### **Inclusion 2**

*Position on landscape:* Lower, north-facing side slopes of mountains

*Contrasting features:* Soils do not have layer of clay accumulation, bedrock at a depth of 20 to 40 inches

*Distinctive present vegetation:* Mountain big sagebrush, Douglas rabbitbrush, bluebunch wheatgrass

##### **Inclusion 3**

*Position on landscape:* Random small peaks and ridges of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

##### **Inclusion 4**

*Position on landscape:* Drainageways of mountains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, rubber rabbitbrush, Idaho fescue, bluebunch wheatgrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Hapgood soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Sumine Soil for Selected Uses

*Range seeding:* Poor—large stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

#### Ratings of the Hapgood Soil for Selected Uses

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

#### Ratings of the Cleavage Soil for Selected Uses

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

### Interpretive Groups

*Capability classification:* Sumine soil—VIIIs, nonirrigated;

Hapgood soil—VIIIs, nonirrigated; Cleavage soil—VIIe, nonirrigated

*Range site:* Sumine soil—024X029N; Hapgood soil—024X032N; Cleavage soil—024X016N

### 1423—Sumine-Chen-Rock outcrop association

#### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 5,700 to 7,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 85 days

#### Composition

##### Major components:

- Sumine very cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—35 percent
  - Chen very gravelly loam, 2 to 8 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—25 percent
  - Rock outcrop—25 percent
- Contrasting inclusions:*
- Inclusion 1: Rubble land—5 percent
  - Inclusion 2: Pachic Haploxerolls, 30 to 50 percent slopes—Pachic Haploxerolls, fine-loamy, mixed, frigid—5 percent
  - Inclusion 3: Aridic Haploxerolls, 8 to 15 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent

#### Characteristics of the Sumine Soil

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—quartzite, breccia, and sandstone

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, basin wildrye

#### Typical Profile

- 0 to 10 inches—very cobbly loam; 30 to 55 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
- 10 to 30 inches—very gravelly clay loam, very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles

(by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.1 to 3.2 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Chen Soil**

*Position on landscape:* Crests of mountains

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass

### **Typical Profile**

0 to 7 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

7 to 15 inches—very cobbly clay, very gravelly clay, extremely gravelly clay; 0 to 45 percent cobbles and stones and 55 to 75 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 1.1 to 1.7 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of Rock Outcrop**

*Position on landscape:* Shoulders, cliffs on canyon walls, and scattered peaks of mountains

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Screes below rock outcrops on side slopes of mountains

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Concave snow pockets on side slopes of mountains

*Contrasting features:* Thick, dark colored surface layer

*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue, bluebunch wheatgrass

#### **Inclusion 3**

*Position on landscape:* Toe slopes and canyon bottoms of mountains

*Contrasting features:* Very deep

*Distinctive present vegetation:* Mountain big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Chen soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines



*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Chen Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, too clayey

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Sumine soil—VIIIs, nonirrigated; Chen soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Sumine soil—024X029N; Chen soil—024X027N

## **1425—Sumine-Loncan association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 7,000 to 7,900 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 70 days

### **Composition**

*Major components:*

- Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—45 percent

- Loncan very gravelly very fine sandy loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—40 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 8 to 15 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—10 percent

- Inclusion 2: Rubble land—3 percent

- Inclusion 3: Rock outcrop—2 percent

### **Characteristics of the Sumine Soil**

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—quartzite and sandstone

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

### **Typical Profile**

0 to 10 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.8 to 4.1 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Loncan Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope feature:* Length—short; shape—convex

*Dominant present vegetation:* Idaho fescue, mountain big sagebrush, antelope bitterbrush

### **Typical Profile**

0 to 14 inches—very gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 55 to 70 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-1, A-2

14 to 31 inches—very gravelly loam, extremely cobbly

loam, very gravelly sandy clay loam; 10 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

31 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 21 to 38 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.1 to 3.6 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests of mountains

*Contrasting features:* Bedrock within a depth of 20 inches

*Distinctive present vegetation:* Low sagebrush, black sagebrush

#### **Inclusion 2**

*Position on landscape:* Rock stringers below rock outcrop and on side slopes of mountains

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Rimrock and scattered peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Loncan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Loncan Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer, large stones

### **Interpretive Groups**

*Capability classification:* Sumine soil—VIIIs, nonirrigated; Loncan soil—VIIs, nonirrigated

*Range site:* Sumine soil—025X009N; Loncan soil—025X012N

## **1426—Sumine-Cleavage-Loncan association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,200 to 7,400 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 90 days

### **Composition**

*Major components:*

- Sumine gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—35 percent
  - Cleavage extremely gravelly loam, 15 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—30 percent
  - Loncan gravelly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—20 percent
- Contrasting inclusions:*
- Inclusion 1: Cleavage extremely gravelly loam, 30 to

50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed frigid—6 percent

- Inclusion 2: Rock outcrop—4 percent
- Inclusion 3: Aridic Haploxerolls, 30 to 50 percent slopes—Aridic Haploxerolls, coarse-loamy, mixed, frigid—3 percent
- Inclusion 4: Cumulic Haploxerolls, 4 to 8 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent

### **Characteristics of the Sumine Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—quartzite and breccia

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, antelope bitterbrush

### **Typical Profile**

0 to 10 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; soft, friable; neutral (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-SM; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly clay loam, very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.5 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Cleavage Soil**

*Position on landscape:* Crest and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, black sagebrush, bluegrass, Idaho fescue

### **Typical Profile**

0 to 4 inches—extremely gravelly loam; 0 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 0 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Loncan Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—chert

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Mountain big sagebrush, Idaho fescue, antelope bitterbrush

### **Typical Profile**

0 to 14 inches—gravelly loam; 0 to 15 percent cobbles

and stones and 25 to 40 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6

14 to 31 inches—very gravelly loam, extremely cobbly loam, very gravelly sandy clay loam; 10 to 55 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

31 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 21 to 38 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.3 to 3.8 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Upper side slopes of mountains

*Contrasting features:* Slopes of 30 to 50 percent

*Distinctive present vegetation:* Low sagebrush, bluegrass

#### **Inclusion 2**

*Position on landscape:* Random small peaks and ridges of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Concave, north-facing snow pockets on side slopes of mountains

*Contrasting features:* Receives additional soil moisture from snow drifts

*Distinctive present vegetation:* Antelope bitterbrush, mountain big sagebrush

#### **Inclusion 4**

*Position on landscape:* Small catch basins and canyon bottoms of mountains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Alpine timothy, Nevada bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Loncan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Loncan Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer, large stones

### ***Interpretive Groups***

*Capability classification:* Sumine soil—VIIe, nonirrigated; Cleavage soil—VIIs, nonirrigated; Loncan soil—VIIe, nonirrigated

*Range site:* Sumine soil—025X009N; Cleavage soil—025X024N; Loncan soil—025X012N

## **1427—Sumine-Itca-Softscrabble association**

### ***Map Unit Setting***

*Position on landscape:* Mountains

*Elevation:* 6,800 to 8,000 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 70 days

### ***Composition***

*Major components:*

- Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—50 percent

- Itca very cobbly loam, 30 to 50 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—20 percent

- Softscrabble gravelly loam, 15 to 50 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—6 percent

- Inclusion 2: Lithic Xerollic Haplargids, 15 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—4 percent

- Inclusion 3: Welch loam, drained, 2 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—3 percent

- Inclusion 4: Rubble land—2 percent

### ***Characteristics of the Sumine Soil***

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—tuffs and breccia

*Slope features:* Length—long; shape—smooth to convex

*Dominant present vegetation:* Mountain big sagebrush, Thurber needlegrass, bluebunch wheatgrass, oceanspray, invading singleleaf pinyon, and Utah juniper

### ***Typical Profile***

0 to 10 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

### ***Soil and Water Features***

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.8 to 4.1 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### ***Characteristics of the Itca Soil***

*Position on landscape:* Shoulders and upper side slopes of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Idaho fescue, singleleaf pinyon, mountain big sagebrush

### ***Typical Profile***

0 to 9 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6

9 to 17 inches—very gravelly clay, very cobbly clay loam; 0 to 55 percent cobbles and stones and 25 to

70 percent pebbles (by weight); prismatic structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, GC; estimated AASHTO classification—A-7, A-2

17 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.8 to 2.3 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Softscrabble Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—extrusive volcanic rock

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, pine bluegrass, currant, basin wildrye, Idaho fescue, bottlebrush squirreltail

### **Typical Profile**

0 to 16 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

16 to 30 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

30 to 60 inches or more—gravelly clay loam; 5 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.1 to 8.2 inches

*Water-supplying capacity:* 14 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Random small peaks and ridges of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Convex, broad crests and shoulders of mountains

*Contrasting features:* Bedrock at a depth of 10 to 20 inches, loamy subsoil

*Distinctive present vegetation:* Low sagebrush, bluegrass

#### **Inclusion 3**

*Position on landscape:* Concave drainageways along canyon bottoms of mountains

*Contrasting features:* Very deep and somewhat poorly drained

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye, rose

#### **Inclusion 4**

*Position on landscape:* Rock screes on side slopes of mountains

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

*Site index for common trees on the Itca Soil:* Singleleaf pinyon—65; Utah juniper—65

*Most important native understory plants:* Thurber needlegrass, bluebunch wheatgrass, Idaho fescue, bluegrass, mountain big sagebrush, snowberry, lupine, curlleaf mountainmahogany

**Wildlife habitat elements:**

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Itca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Softscrabble soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Itca Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, too clayey, small stones

*Shallow excavations:* Severe—depth to bedrock, slope, large stones

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Softscrabble Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim, small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

**Interpretive Groups**

*Capability classification:* Sumine soil—VIIIs, nonirrigated;

Itca soil—VIIIs, nonirrigated; Softscrabble soil—VIIe, nonirrigated

*Range site:* Sumine soil—024X029N; Itca soil—025X061N; Softscrabble soil—024X021N

*Woodland suitability group:* Itca soil—2R

**1428—Sumine-Rubble land-Cleavage association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,400 to 8,200 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 80 days

**Composition**

*Major components:*

- Sumine very gravelly loam, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—40 percent

- Rubble land—30 percent

- Cleavage extremely gravelly loam, 15 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—15 percent

*Contrasting inclusions:*

- Inclusion 1: Aridic Argixerolls, 30 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—8 percent

- Inclusion 2: Rock outcrop—5 percent

- Inclusion 3: Aridic Haploxerolls, 50 to 75 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent

**Characteristics of the Sumine Soil**

*Position on landscape:* Predominantly south- and west-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—breccias

*Slope features:* Length—long; shape—smooth to convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, basin wildrye, Idaho fescue

**Typical Profile**

0 to 10 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35

to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.8 to 4.1 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of Rubble Land**

*Position on landscape:* Screes on side slopes of mountains

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* None

### **Characteristics of the Cleavage Soil**

*Position on landscape:* Windswept crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, black sagebrush, bluegrass, low rabbitbrush

### **Typical Profile**

0 to 4 inches—extremely gravelly loam; 0 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 0 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than

2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave, north-facing side slopes of mountains

*Contrasting features:* Deep soils that have a clay loam layer of clay accumulation

*Distinctive present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue

#### **Inclusion 2**

*Position on landscape:* Rimrock on side slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Smooth to concave areas below rock outcrop and scree slopes of mountains

*Contrasting features:* Deep soils that are gravelly loam throughout the profile

*Distinctive present vegetation:* Common chokecherry, currant, snowberry

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—small stones, erodes easily



*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—large stones

#### **Interpretive Groups**

*Capability classification:* Sumine soil—VIIIs, nonirrigated; Rubble land—VIIIIs; Cleavage soil—VIIIs, nonirrigated  
*Range site:* Sumine soil—024X029N; Cleavage soil—024X016N

### **1429—Sumine-Winada Variant-Pernty association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,500 to 9,200 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 43 degrees F  
*Frost-free season:* About 70 days

#### **Composition**

##### *Major components:*

- Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—40 percent
- Winada Variant very gravelly fine sandy loam, 30 to 50 percent slopes—Argic Cryoborolls, loamy-skeletal, mixed—25 percent
- Pernty very gravelly sandy loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—25 percent

##### *Contrasting inclusions:*

- Inclusion 1: Cleavage extremely gravelly sandy loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 2: Rock outcrop—5 percent

#### **Characteristics of the Sumine Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—quartzite

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Mountain big sagebrush, rabbitbrush, bluebunch wheatgrass

#### **Typical Profile**

0 to 10 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4  
 10 to 30 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7  
 30 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.8 to 4.1 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

#### **Characteristics of the Winada Variant Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—chert

*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Idaho fescue, mountain big sagebrush, mountain brome, serviceberry

### Typical Profile

0 to 7 inches—very gravelly fine sandy loam; 5 to 10 percent cobbles and stones and 55 to 70 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

7 to 24 inches—very gravelly sandy clay loam; 5 to 10 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

24 to 45 inches—extremely gravelly loam; 5 to 15 percent cobbles and stones and 75 to 85 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

45 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 40 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.2 to 4.6 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—3; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Pernty Soil

*Position on landscape:* Shoulders and upper side slopes of mountains  
*Parent material:* Kind—residuum; source—chert and quartzite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Mountain big sagebrush, snowberry, rabbitbrush, bluebunch wheatgrass  
*Surface cover:* 25 percent pebbles

### Typical Profile

0 to 3 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2

3 to 14 inches—very gravelly clay loam, very gravelly loam, very cobbly clay loam; 10 to 30 percent cobbles and stones and 45 to 55 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-7, A-6

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.4 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex ridges and crests of mountains  
*Contrasting features:* Extremely gravelly surface layer  
*Distinctive present vegetation:* Low sagebrush, Idaho fescue, Sandberg bluegrass

#### Inclusion 2

*Position on landscape:* Rimrock and extremely eroded side slopes of mountains  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Sumine soil for named elements:* Wild

herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Winada Variant soil for named elements:*

Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Suitability of the Pernty soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Winada Variant Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—thin layer

**Ratings of the Pernty Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope, depth to bedrock

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—slope, depth to bedrock

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Sumine soil—VIIs, nonirrigated; Winada Variant soil—VIIs, nonirrigated; Pernty soil—VIIs, nonirrigated

*Range site:* Sumine soil—024X029N; Winada Variant soil—024X032N; Pernty soil—024X021N

**1450—Atlow, steep-Atlow-Stingdorn association**

**Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,200 to 6,100 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Atlow very gravelly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—45 percent

- Atlow very gravelly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—20 percent

- Stingdorn cobbly loam, 15 to 30 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Colbar gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—5 percent

- Inclusion 2: Xerollic Haplargids, 15 to 30 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—5 percent

- Inclusion 3: Xeric Torriorthents, 4 to 15 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

**Characteristics of the Atlow, Steep, Soil**

*Position on landscape:* Predominantly north- and east-facing side slopes of foothills

*Parent material:* Kind—residuum; source—chert, shale, and rhyolitic tuffs

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, Douglas rabbitbrush, ephedra, Utah juniper

**Typical Profile**

0 to 3 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6

3 to 14 inches—very gravelly clay loam, very cobbly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline

(pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

14 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Atlow Soil**

*Position on landscape:* Crests and shoulder slopes of foothills

*Parent material:* Kind—residuum; source—cherts, shales, and rhyolitic tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, Douglas rabbitbrush, bottlebrush squirreltail, ephedra, Utah juniper

#### **Typical Profile**

0 to 3 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6

3 to 14 inches—very gravelly clay loam, very cobbly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

14 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Moderately rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Stingdorn Soil**

*Position on landscape:* South- and west-facing, lower side slopes of foothills

*Parent material:* Kind—residuum; source—rhyolitic tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC; estimated AASHTO classification—A-6

15 to 20 inches—indurated duripan; massive; extremely hard, extremely firm

20 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to hardpan:* 8 to 20 inches

*Depth to bedrock:* 8 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.7 to 2.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly concave, north-facing side slopes and foot slopes of foothills

*Contrasting features:* Bedrock at a depth of 20 to 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

#### **Inclusion 2**

*Position on landscape:* Convex, upper, south-facing side slopes of foothills

*Contrasting features:* Duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Black sagebrush, bluegrass

#### **Inclusion 3**

*Position on landscape:* Concave drainageways of foothills

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Atlow, steep, soil for named elements:*  
 Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Atlow soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Atlow, Steep, Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Atlow Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, cemented pan

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Stingdorn Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope, cemented pan

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, large stones

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Atlow, steep, soil—VIIe, nonirrigated; Atlow soil—VIIs, nonirrigated; Stingdorn soil—VIIe, nonirrigated

*Range site:* Atlow, steep, soil—024X030N; Atlow soil—024X030N; Stingdorn soil—024X002N

## **1451—Atlow-Reluctan-Trunk association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,800 to 6,600 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 90 days

### **Composition**

#### **Major components:**

- Atlow very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—35 percent

- Reluctan cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—30 percent

- Trunk very cobbly loam, 15 to 30 percent slopes—

Xerollic Haplargids, fine, montmorillonitic, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Perwick very gravelly loam, 50 to 75 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—8 percent
- Inclusion 2: Aridic Haploxerolls, 15 to 30 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 3: Rock outcrop—2 percent

### **Characteristics of the Atlow Soil**

*Position on landscape:* Shoulders and upper side slopes of mountains

*Parent material:* Kind—residuum; source—chert and rhyolitic tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, phlox, Sandberg bluegrass, small rabbitbrush

### **Typical Profile**

0 to 3 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6

3 to 14 inches—very gravelly clay loam, very cobbly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Reluctant Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—rhyolitic rocks

*Slope features:* Length—short; shape—concave to slightly convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, bluegrass

### **Typical Profile**

0 to 8 inches—cobbly loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

8 to 33 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

33 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.0 to 5.2 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Trunk Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—chert, andesite, and rhyolite

*Slope features:* Length—long; shape—convex to slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, bottlebrush squirreltail, small rabbitbrush, horsebrush

## Typical Profile

- 0 to 5 inches—very cobbly loam; 30 to 45 percent cobbles and stones and 25 to 50 percent pebbles (by weight); granular structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4, A-6
- 5 to 28 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7
- 28 inches—unweathered bedrock

## Soil and Water Features

- Depth to bedrock:* 20 to 40 inches
- Depth to seasonal high water table:* More than 60 inches
- Frequency of flooding:* None
- Permeability:* Very slow
- Available water capacity:* 3.1 to 4.0 inches
- Water-supplying capacity:* 9 inches
- Runoff:* Rapid
- Hydrologic group:* D
- Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8
- Hazard of erosion:* By water—slight; by wind—slight
- Shrink-swell potential:* High
- Corrosivity:* To steel—high; to concrete—low
- Potential frost action:* Low

## Contrasting Inclusions

### Inclusion 1

- Position on landscape:* Convex, south-facing, eroded side slopes of mountains
- Contrasting features:* Eroded surface layer
- Distinctive present vegetation:* Utah juniper, black sagebrush, bluegrass

### Inclusion 2

- Position on landscape:* Concave, high elevation, south-facing back slopes of mountains
- Contrasting features:* Deep soils that have a dark colored surface layer
- Distinctive present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, bluebunch wheatgrass

### Inclusion 3

- Position on landscape:* Random small peaks, ridges, and severely eroded side slopes of mountains
- Contrasting features:* Bedrock exposed at the soil surface
- Distinctive present vegetation:* Barren

## Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

- Suitability of the Atlow soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
- Suitability of the Reluctan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
- Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Atlow Soil for Selected Uses

- Range seeding:* Poor—droughty, small stones
- Daily cover for landfill:* Poor—depth to bedrock, small stones, slope
- Shallow excavations:* Severe—depth to bedrock, slope
- Local roads and streets:* Severe—depth to bedrock, slope
- Roadfill:* Poor—depth to bedrock, slope
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Poor—depth to bedrock, small stones, slope
- Pond reservoir areas:* Severe—depth to bedrock, slope
- Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Reluctan Soil for Selected Uses

- Range seeding:* Poor—erodes easily
- Daily cover for landfill:* Poor—depth to bedrock, small stones, slope
- Shallow excavations:* Severe—depth to bedrock, slope
- Local roads and streets:* Severe—slope
- Roadfill:* Poor—depth to bedrock, slope
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Poor—small stones, slope
- Pond reservoir areas:* Severe—slope
- Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Trunk Soil for Selected Uses

- Range seeding:* Poor—large stones
- Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones
- Shallow excavations:* Severe—depth to bedrock, slope
- Local roads and streets:* Severe—low strength, shrink-swell, slope
- Roadfill:* Poor—low strength, slope
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Poor—small stones, slope
- Pond reservoir areas:* Severe—slope
- Embankments, dikes, and levees:* Severe—thin layer

### ***Interpretive Groups***

*Capability classification:* Atlow soil—VIIe, nonirrigated; Reluctan soil—VIIs, nonirrigated; Trunk soil—VIIs, nonirrigated

*Range site:* Atlow soil—024X030N; Reluctan soil—024X021N; Trunk soil—024X005N

## **1452—Atlow-Minat-Old Camp association**

### ***Map Unit Setting***

*Position on landscape:* Mountains

*Elevation:* 5,200 to 6,200 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 110 days

### ***Composition***

*Major components:*

- Atlow gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—45 percent
  - Minat very gravelly loam, 15 to 30 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—30 percent
  - Old Camp very cobbly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—15 percent
- Contrasting inclusions:*
- Inclusion 1: Aridic Argixerolls, 15 to 30 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—8 percent
  - Inclusion 2: Rock outcrop—2 percent

### ***Characteristics of the Atlow Soil***

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—chert, shale, greenstone, and altered rhyolitic tuff

### ***Typical Profile***

- 0 to 3 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC, CL; estimated AASHTO classification—A-6
- 3 to 14 inches—very gravelly clay loam, very cobbly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified

classification—GC; estimated AASHTO

classification—A-2, A-6, A-7

14 inches—unweathered bedrock

### ***Soil and Water Features***

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.2 to 1.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### ***Characteristics of the Minat Soil***

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—colluvium influenced by volcanic ash; source—chert and shale

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass, bluebunch wheatgrass

### ***Typical Profile***

- 0 to 9 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2
- 9 to 27 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2
- 27 to 60 inches or more—very gravelly fine sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2



### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 5.6 to 6.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Old Camp Soil

*Position on landscape:* Summits of mountain plateaus  
*Parent material:* Kind—residuum; source—ash flow tuffs  
*Slope features:* Length—long; shape—slightly concave to slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, small rabbitbrush, green ephedra

### Typical Profile

0 to 3 inches—very cobbly loam; 35 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, SM-SC, SC; estimated AASHTO classification—A-2, A-4, A-6  
 3 to 15 inches—very cobbly clay loam; 35 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6  
 15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.5 to 1.9 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave, north-facing side slopes of mountains  
*Contrasting features:* Bedrock at a depth of 20 to 40 inches; thick, dark colored surface layer  
*Distinctive present vegetation:* Mountain big sagebrush, western wheatgrass

#### Inclusion 2

*Position on landscape:* Rimrock on shoulder slopes of mountains  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Atlow soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Minat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Atlow Soil for Selected Uses

*Range seeding:* Poor—droughty  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Minat Soil for Selected Uses

*Range seeding:* Poor—small stones  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

#### **Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, large stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Interpretive Groups**

*Capability classification:* Atlow soil—VIIe, nonirrigated;  
Minat soil—VIIs, nonirrigated; Old Camp soil—VIIs,  
nonirrigated

*Range site:* Atlow soil—024X030N; Minat soil—  
024X005N; Old Camp soil—024X047N

### **1453—Atlow-Colbar-Rock outcrop association**

#### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,200 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Atlow very gravelly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—60 percent
- Colbar gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—15 percent
- Rock outcrop—10 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—6 percent
- Inclusion 2: Typic Natrargids, 15 to 50 percent slopes—Typic Natrargids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Durixerollic Camborthids, 4 to 15 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—4 percent

#### **Characteristics of the Atlow Soil**

*Position on landscape:* Crests and side slopes of foothills

*Parent material:* Kind—residuum; source—altered rhyolitic ash flow tuff

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail, Sandberg bluegrass

#### **Typical Profile**

0 to 3 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6

3 to 14 inches—very gravelly clay loam, very cobbly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

14 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuffs

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bottlebrush squirreltail, Sandberg bluegrass

### Typical Profile

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, GM-GC, GM; estimated AASHTO classification—A-4

3 to 22 inches—cobble loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobble loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.4 to 3.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of Rock Outcrop

*Position on landscape:* Scattered peaks of foothills

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly concave, colluvial back slopes of foothills

*Contrasting features:* Deep

*Distinctive present vegetation:* Black sagebrush, bottlebrush squirreltail

#### Inclusion 2

*Position on landscape:* Convex, lower side slopes of foothills

*Contrasting features:* Sodium-affected layer of clay accumulation

*Distinctive present vegetation:* Shadscale, small rabbitbrush, bud sagebrush

#### Inclusion 3

*Position on landscape:* Concave foot slopes of foothills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, Nevada bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Atlow soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Atlow Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Colbar Soil for Selected Uses

*Range seeding:* Fair—droughty

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, small stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Atlow soil—VIIIs, nonirrigated; Colbar soil—VIe, nonirrigated; Rock outcrop—VIIIs

*Range site:* Atlow soil—024X030N; Colbar soil—024X005N

## **1532—Cleavage-Rubble land-Bregar association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,200 to 7,200 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 90 days

### **Composition**

*Major components:*

- Cleavage very gravelly fine sandy loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—45 percent
- Rubble land—25 percent
- Bregar very gravelly fine sandy loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—8 percent
- Inclusion 2: Locane extremely gravelly sandy loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—7 percent

### **Characteristics of the Cleavage Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Idaho fescue, bluebunch wheatgrass, low sagebrush

### **Typical Profile**

0 to 4 inches—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 25 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of Rubble Land**

*Position on landscape:* Screens on side slopes of mountains

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* None

### **Characteristics of the Bregar Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Idaho fescue, low sagebrush, bluegrass, black sagebrush

### **Typical Profile**

0 to 4 inches—very gravelly fine sandy loam; 10 to 20 percent cobbles and stones and 45 to 60 percent pebbles (by weight); platy structure; soft, very friable; slightly acid (pH 6.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-1, A-2

4 to 11 inches—very gravelly clay loam, extremely gravelly loam, very cobbly sandy clay loam; 0 to 40 percent cobbles and stones and 65 to 80 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

11 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 5 to 12 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow  
*Available water capacity:* 0.9 to 1.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Random small peaks of mountains  
*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* South-facing, lower side slopes of mountains  
*Contrasting features:* Very gravelly clay loam or very gravelly clay layer of clay accumulation  
*Distinctive present vegetation:* Black sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Bregar soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—slope, depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Bregar Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, rooting depth  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Cleavage soil—VIIIs, nonirrigated; Rubble land—VIIIIs; Bregar soil—VIIIs, nonirrigated  
*Range site:* Cleavage soil—025X017N; Bregar soil—024X016N

## **1542—Linrose-Cleavage-Pernty association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,600 to 8,000 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 80 days

### **Composition**

#### *Major components:*

- Linrose gravelly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—30 percent
  - Cleavage very gravelly loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—30 percent
  - Pernty very gravelly loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—25 percent
- Contrasting inclusions:*
- Inclusion 1: Rubble land—6 percent
  - Inclusion 2: Bregar extremely cobbly loam, 30 to 75 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 3: Glean silt loam, 50 to 75 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—3 percent
  - Inclusion 4: Aridic Haploxerolls, 30 to 50 percent slopes—Aridic Haploxerolls, fine-loamy, mixed, frigid—1 percent

### **Characteristics of the Linrose Soil**

*Position on landscape:* North-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—chert and quartzite  
*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Idaho fescue, black sagebrush, bluegrass

*Surface cover:* 30 percent pebbles, 10 percent cobbles

### **Typical Profile**

0 to 8 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, ML; estimated AASHTO classification—A-4

8 to 26 inches—very gravelly loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.4 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Cleavage Soil**

*Position on landscape:* Crest and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Dominant present vegetation:* Low sagebrush, bluebunch wheatgrass, Idaho fescue

### **Typical Profile**

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2, A-4, A-6

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 25 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Pernty Soil**

*Position on landscape:* West-, east-, and upper south-facing side slopes of mountains

*Parent material:* Kind—residuum; source—chert and quartzite

*Slope features:* Length—long; shape—smooth to slightly concave

*Dominant present vegetation:* Idaho fescue, bluebunch wheatgrass, basin wildrye

### **Typical Profile**

0 to 3 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

3 to 14 inches—very gravelly clay loam, very gravelly loam, very cobbly clay loam; 10 to 30 percent cobbles and stones and 45 to 55 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-7, A-6

14 inches—unweathered bedrock

**Soil and Water Features***Depth to bedrock:* 14 to 20 inches*Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* Moderately slow*Available water capacity:* 1.1 to 1.4 inches*Water-supplying capacity:* 10 inches*Runoff:* Rapid*Hydrologic group:* D*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7*Hazard of erosion:* By water—moderate; by wind—slight*Shrink-swell potential:* Moderate*Corrosivity:* To steel—moderate; to concrete—low*Potential frost action:* Moderate**Contrasting Inclusions****Inclusion 1***Position on landscape:* Rock screes on south-facing side slopes of mountains*Contrasting features:* More than 90 percent stones on the surface*Distinctive present vegetation:* Barren**Inclusion 2***Position on landscape:* Convex lower side slopes of mountains*Contrasting features:* Thin, light colored surface layer*Distinctive present vegetation:* Black sagebrush, low sagebrush**Inclusion 3***Position on landscape:* Concave, north-facing side slopes of mountains*Contrasting features:* Deep soil that receives extra moisture from drifted snow*Distinctive present vegetation:* Idaho fescue**Inclusion 4***Position on landscape:* Lower, south-facing side slopes of mountains*Contrasting features:* Deep soils*Distinctive present vegetation:* Bluebunch wheatgrass, mountain big sagebrush**Major Uses****Current uses:** Rangeland, wildlife habitat**Wildlife habitat elements:***Suitability of the Linrose soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair*Suitability of the Pernty soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair**Ratings of the Linrose Soil for Selected Uses***Range seeding:* Poor—erodes easily*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope*Shallow excavations:* Severe—depth to bedrock, slope*Local roads and streets:* Severe—slope*Roadfill:* Poor—depth to bedrock, slope*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—small stones, slope*Pond reservoir areas:* Severe—slope*Embankments, dikes, and levees:* Severe—thin layer**Ratings of the Cleavage Soil for Selected Uses***Range seeding:* Poor—small stones, droughty*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope*Shallow excavations:* Severe—depth to bedrock, slope*Local roads and streets:* Severe—depth to bedrock, slope*Roadfill:* Poor—slope, depth to bedrock*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—depth to bedrock, small stones, slope*Pond reservoir areas:* Severe—depth to bedrock, slope*Embankments, dikes, and levees:* Severe—large stones**Ratings of the Pernty Soil for Selected Uses***Range seeding:* Poor—droughty, small stones*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope*Shallow excavations:* Severe—slope, depth to bedrock*Local roads and streets:* Severe—slope, depth to bedrock*Roadfill:* Poor—slope, depth to bedrock*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—depth to bedrock, small stones, slope*Pond reservoir areas:* Severe—slope, depth to bedrock*Embankments, dikes, and levees:* Severe—thin layer**Interpretive Groups***Capability classification:* Linrose soil—VIIe, nonirrigated; Cleavage soil—VIIs, nonirrigated; Pernty soil—VIIs, nonirrigated*Range site:* Linrose soil—024X042N; Cleavage soil—024X027N; Pernty soil—024X021N**1570—Koynik Variant-Oxcurel-Whirlo association****Map Unit Setting***Position on landscape:* Volcanic cones and associated fan piedmonts

*Elevation:* 4,800 to 5,200 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Koyunik Variant very gravelly sandy loam, 15 to 50 percent slopes, rubbly—Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—35 percent
- Oxcorel cobbly very fine sandy loam, 2 to 8 percent slopes—Durorthic Natrargids, fine, montmorillonitic, mesic—30 percent
- Whirlo cobbly very fine sandy loam, 4 to 15 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Xerollic Camborthids, 50 to 75 percent slopes—Lithic Xerollic Camborthids, loamy-skeletal, mixed, mesic—9 percent
- Inclusion 2: Durorthic Torriorthents, 2 to 8 percent slopes—Durorthic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—4 percent
- Inclusion 3: Rock outcrop—1 percent
- Inclusion 4: Rubble land—1 percent

### **Characteristics of the Koyunik Variant Soil**

*Position on landscape:* Side slopes of volcanic cones

*Parent material:* Kind—ash capped residuum; source—basalt

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, ephedra

*Surface cover:* 50 percent pebbles, 20 percent cobbles, 15 percent stones

### **Typical Profile**

0 to 5 inches—very gravelly sandy loam; 25 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1

5 to 13 inches—very gravelly fine sandy loam, very gravelly sandy loam; 0 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1

13 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 0.6 to 1.1 inches

*Water-supplying capacity:* 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—cobbly very fine sandy loam; 15 to 30 percent cobbles and stones and 20 to 40 percent pebbles (by weight); platy structure; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4

8 to 34 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 34 inches—very slow; below this depth—moderately rapid



*Available water capacity:* 5.1 to 7.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of the Whirlo Soil**

*Position on landscape:* Inset fans and alluvial fans below hills

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—irregular

### **Typical Profile**

0 to 7 inches—cobbly very fine sandy loam; 15 to 25 percent cobbles and stones and 10 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

7 to 13 inches—gravelly sandy loam, gravelly loam, fine sandy loam; 0 to 10 percent cobbles and stones and 15 to 45 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM, ML; estimated AASHTO classification—A-2, A-4

13 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 5 to 30 percent cobbles and stones and 50 to 75 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.9 to 5.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing side slopes of volcanic cones

*Contrasting features:* Slopes of more than 50 percent

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Areas adjacent to concave drainageways of fan piedmont remnants

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Shoulder slopes of volcanic cones

*Contrasting features:* Bedrock exposed at the soil surface of volcanic cones

*Distinctive present vegetation:* Barren

#### **Inclusion 4**

*Position on landscape:* Rock stringers on side slopes of volcanic cones

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Koynik Variant soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Koynik Variant Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—slope, depth to bedrock

*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Oxcorel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones, excess sodium

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

**Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—large stones, slope

*Local roads and streets:* Moderate—large stones, slope

*Roadfill:* Fair—large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Koynik Variant soil—VIIs, nonirrigated; Oxcorel soil—VIIs, nonirrigated; Whirlo soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Koynik Variant soil—024X002N; Oxcorel soil—024X002N; Whirlo soil—024X002N

**1600—Dumps and Pits, mine****Map Unit Setting**

*Position on landscape:* Hills and fan piedmonts

*Elevation:* 4,800 to 7,900 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Dumps and Pits, mine—100 percent

**Characteristics of Pits and Dumps**

*Position on landscape:* Side slopes of hills and adjacent fan piedmonts

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Barren or annual grasses, forbs, and rabbitbrush

**1601—Pits, gravel****Map Unit Setting**

*Position on landscape:* Fan piedmonts or beach plains

*Elevation:* 4,400 to 6,800 feet

*Average annual precipitation:* About 7 to 12 inches

*Average annual air temperature:* About 42 to 48 degrees F

*Frost-free season:* About 80 to 120 days

**Composition**

*Major components:*

- Pits, gravel—100 percent

**Characteristics of Pits, Gravel**

*Position on landscape:* Fan piedmonts or beach plains

*Parent material:* Mixed alluvium or lacustrine beach deposits

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* None

**1662—Floer-Slaven-Roca association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 80 days

**Composition**

*Major components:*

- Floer gravelly silt loam, 8 to 15 percent slopes—Aridic Palexerolls, clayey-skeletal, montmorillonitic, frigid—45 percent
- Slaven loam, 15 to 30 percent slopes, very stony—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—20 percent
- Roca very gravelly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—20 percent

*Contrasting inclusions:*

- Inclusion 1: Glean gravelly silt loam, 30 to 75 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—10 percent
- Inclusion 2: Linrose gravelly silt loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—3 percent
- Inclusion 3: Durixerollic Haplargids, 15 to 30 percent

slopes—Durixerollic Haplargids, loamy-skeletal, mixed, frigid—2 percent

### **Characteristics of the Floer Soil**

*Position on landscape:* East- and west-facing side slopes of mountains

*Parent material:* Kind—residuum influenced by loess; source—chert

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Low sagebrush, Idaho fescue

*Surface cover:* 30 percent pebbles, 5 percent cobbles and stones

### **Typical Profile**

0 to 12 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-4

12 to 50 inches—very cobbly clay, extremely stony clay; 45 to 55 percent cobbles and stones and 45 to 65 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

50 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 5.5 to 7.4 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.32; T value—3; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Moderate

### **Characteristics of the Slaven Soil**

*Position on landscape:* Upper, south-facing side slopes of mountains

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—chert and shale

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Thurber needlegrass

*Rock fragments on surface:* Kind—stones; percentage of surface covered—2

### **Typical Profile**

0 to 5 inches—loam; 10 to 25 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 22 inches—extremely gravelly clay, extremely gravelly sandy clay, extremely gravelly clay loam; 75 to 85 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

22 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.0 to 2.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Roca Soil**

*Position on landscape:* Lower, south-facing side slopes of mountains

*Parent material:* Kind—residuum; source—chert and shale

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Wyoming and mountain big sagebrush, bluegrass, bluebunch wheatgrass

### **Typical Profile**

0 to 5 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

5 to 27 inches—very gravelly clay loam, very gravelly

clay; 0 to 15 percent cobbles and stones and 50 to 60 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

27 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper, concave, north-facing side slopes of mountains

*Contrasting features:* Thick, dark colored surface layer; higher water-supplying capacity from drifted snow

*Distinctive present vegetation:* Idaho fescue

#### Inclusion 2

*Position on landscape:* Upper, convex, north-facing side slopes of mountains

*Contrasting features:* Deep soils; very gravelly loam throughout the profile

*Distinctive present vegetation:* Idaho fescue

#### Inclusion 3

*Position on landscape:* Lower, north-facing side slopes of mountains

*Contrasting features:* Layer of weak silica accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Floer soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Slaven soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Roca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Floer Soil for Selected Uses

*Range seeding:* Fair—too arid, rooting depth

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—depth to bedrock, too clayey, slope

*Local roads and streets:* Severe—shrink-swell

*Roadfill:* Poor—shrink-swell

*Sand:* Improbable source—large stones, excess fines

*Gravel:* Improbable source—large stones, excess fines

*Topsoil:* Poor—small stones, area reclaim, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

### Ratings of the Slaven Soil for Selected Uses

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, too clayey, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Roca Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Floer soil—VIIIs, nonirrigated; Slaven soil—VIIIs, nonirrigated; Roca soil—VIIIs, nonirrigated

*Range site:* Floer soil—024X027N; Slaven soil—025X014N; Roca soil—024X028N

## 1670—Wieland-Allor association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,800 to 6,200 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Wieland loam, 2 to 8 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—70 percent
- Allor very cobbly loam, 15 to 30 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Orovada fine sandy loam, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—7 percent
- Inclusion 2: Xerollic Haplargids, 2 to 8 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—5 percent
- Inclusion 3: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—3 percent

### **Characteristics of the Wieland Soil**

*Position on landscape:* Broad summits of fan piedmont remnants

*Parent material:* Kind—alluvium; source—extrusive volcanic rock

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

- 0 to 8 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
- 8 to 20 inches—gravelly clay; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); prismatic structure; hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CH, SC; estimated AASHTO classification—A-7
- 20 to 60 inches or more—loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.0 to 9.6 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Allor Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bottlebrush squirreltail, spiny hopsage

### **Typical Profile**

- 0 to 12 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-2, A-4
- 12 to 34 inches—gravelly clay loam, gravelly sandy clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6, A-7
- 34 to 60 inches or more—gravelly loamy sand, very gravelly loamy sand; 0 to 10 percent cobbles and stones and 35 to 55 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.7 to 6.0 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans

*Contrasting features:* Very gravelly sandy loam throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Foot slopes of adjacent hills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, rubber rabbitbrush, Wyoming big sagebrush, basin wildrye

#### **Inclusion 3**

*Position on landscape:* Shoulder slopes of fan piedmont remnants

*Contrasting features:* Lacks layer of clay accumulation, gravelly sandy loam throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Wieland soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Allor soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Wieland Soil for Selected Uses**

*Range seeding:* Poor—rooting depth

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim, small stones

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Moderate—thin layer

### **Ratings of the Allor Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Wieland soil—IIIe, irrigated, and VIs, nonirrigated; Allor soil—VIIIs, nonirrigated

*Range site:* Wieland soil—024X005N; Allor soil—024X005N

## **1671—Wieland-Oxcorel-Allor association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,500 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Wieland loam, 2 to 8 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—50 percent
- Oxcorel gravelly fine sandy loam, 2 to 4 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—20 percent
- Allor very cobbly loam, 15 to 30 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Durargids, 2 to 8 percent slopes—Xerollic Durargids, fine-loamy, mixed, mesic—5 percent
- Inclusion 2: Xerollic Durargids, 4 to 15 percent slopes—Xerollic Durargids, fine-loamy, mixed, mesic—4 percent
- Inclusion 3: Xeric Torriorthents, 15 to 50 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—3 percent
- Inclusion 4: Xerollic Camborthids, 0 to 4 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—3 percent

### **Characteristics of the Wieland Soil**

*Position on landscape:* Upper summits of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Sandberg bluegrass

### Typical Profile

0 to 8 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

8 to 20 inches—gravelly clay; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); prismatic structure; hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CH, SC; estimated AASHTO classification—A-7

20 to 60 inches or more—loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4, A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.0 to 9.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Oxcorel Soil

*Position on landscape:* Broad, lower summits of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

*Surface cover:* 25 percent pebbles, 5 percent cobbles

### Typical Profile

0 to 5 inches—gravelly fine sandy loam; 0 to 10 percent

cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4, A-2

5 to 20 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

20 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 20 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 4.8 to 6.7 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Characteristics of the Allor Soil

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth to slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, small rabbitbrush, spiny hopsage

### Typical Profile

0 to 12 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC;

estimated AASHTO classification—A-2, A-4  
 12 to 34 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6, A-7  
 34 to 60 inches or more—gravelly loamy sand, very gravelly loamy sand; 0 to 10 percent cobbles and stones and 35 to 55 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 4.7 to 6.0 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Highest summits of fan piedmont remnants  
*Contrasting features:* Duripan at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

#### Inclusion 2

*Position on landscape:* North-facing, upper side slopes of fan piedmont remnants  
*Contrasting features:* Duripan at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Black sagebrush, bottlebrush squirreltail

#### Inclusion 3

*Position on landscape:* Convex, eroded escarpments of fan piedmont remnants  
*Contrasting features:* Extremely gravelly throughout the profile  
*Distinctive present vegetation:* Indian ricegrass, Wyoming big sagebrush

### Inclusion 4

*Position on landscape:* Inset fans  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Wieland soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Allor soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Wieland Soil for Selected Uses

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—too clayey  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—area reclaim, small stones  
*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Moderate—thin layer

### Ratings of the Oxcorel Soil for Selected Uses

*Range seeding:* Poor—too arid, rooting depth, excess sodium  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—too clayey  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, excess sodium, area reclaim  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### Ratings of the Allor Soil for Selected Uses

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—slope



*Roadfill:* Fair—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Wieland soil—IIIe, irrigated, and VIs, nonirrigated; Oxcorel soil—IVs, irrigated, and VIIs, nonirrigated; Allor soil—VIIs, nonirrigated

*Range site:* Wieland soil—024X005N; Oxcorel soil—024X002N; Allor soil—024X005N

## **1673—Wieland-Grassval-Puett association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 6,000 to 6,400 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 105 days

### **Composition**

*Major components:*

- Wieland gravelly loam, 8 to 15 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—40 percent

- Grassval gravelly loam, 2 to 8 percent slopes—Xerollic Durargids, loamy, mixed, mesic, shallow—25 percent

- Puett very gravelly loam, 30 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Haploxerollic Durargids, 2 to 8 percent slopes—Haploxerollic Durargids, loamy, mixed, mesic, shallow—7 percent

- Inclusion 2: Xeric Torriorthents, 30 to 50 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—4 percent

- Inclusion 3: Aridic Haploxerolls, 2 to 4 percent slopes—Aridic Haploxerolls, coarse-loamy, mixed, mesic—4 percent

### **Characteristics of the Wieland Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, pine bluegrass, Sandberg bluegrass

### **Typical Profile**

0 to 8 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6

8 to 20 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CH, SC; estimated AASHTO classification—A-7

20 to 60 inches or more—loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 5.7 to 9.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Grassval Soil**

*Position on landscape:* Summits and south-facing shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 4 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated

Unified classification—SM-SC; estimated AASHTO classification—A-2, A-4

4 to 13 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-6

13 inches—indurated duripan; massive

### **Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Puett Soil**

*Position on landscape:* Side slopes of fan piedmont remnants with a shallow rock core

*Parent material:* Kind—loamy residuum; source—soft, tuffaceous sedimentary formations

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, Wyoming big sagebrush, Utah juniper

### **Typical Profile**

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1

4 to 15 inches—coarse sandy loam, gravelly sandy loam, loam; 10 to 50 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML, GM; estimated AASHTO classification—A-1, A-2, A-4

15 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 1.7 to 2.1 inches

*Water-supplying capacity:* 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests of fan piedmont remnants

*Contrasting features:* Strongly cemented duripan at a depth of 10 to 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

#### **Inclusion 2**

*Position on landscape:* North-facing, upper elevation side slopes of fan piedmont remnants with a rock core

*Contrasting features:* Soft bedrock at a depth of 20 to 30 inches

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Inset fans

*Contrasting features:* Very deep soils, receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Wieland soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Grassval soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Puett soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Wieland Soil for Selected Uses**

*Range seeding:* Poor—rooting depth

*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—too clayey, slope  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—thin layer

#### **Ratings of the Grassval Soil for Selected Uses**

*Range seeding:* Poor—droughty, rooting depth  
*Daily cover for landfill:* Poor—cemented pan, small stones

*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan  
*Roadfill:* Cemented pan  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—cemented pan, small stones  
*Pond reservoir areas:* Severe—cemented pan  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Puett Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—seepage, piping

#### **Interpretive Groups**

*Capability classification:* Wieland soil—VIs, nonirrigated;  
 Grassval soil—VIIIs, nonirrigated; Puett soil—VIIe, nonirrigated  
*Range site:* Wieland soil—024X005N; Grassval soil—024X030N; Puett soil—025X025N

### **1680—Zineb gravelly loam, 2 to 8 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,800 to 5,300 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 110 days

#### **Composition**

##### *Major components:*

• Zineb gravelly loam, 2 to 8 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—85 percent

##### *Contrasting inclusions:*

• Inclusion 1: Whirlo gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—10 percent  
 • Inclusion 2: Xerollic Camborthids, 0 to 4 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

#### **Characteristics of the Zineb Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loamy mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, gray horsebrush, Sandberg bluegrass, bottlebrush squirreltail

*Surface cover:* 20 percent pebbles

#### **Typical Profile**

0 to 11 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
 11 to 20 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 55 to 75 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-2  
 20 to 45 inches—extremely cobbly loamy coarse sand, extremely cobbly coarse sand; 50 to 75 percent cobbles and stones or 55 to 85 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1  
 45 to 60 inches or more—loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 4.3 to 4.9 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, lower margins of fan skirts

*Contrasting features:* Lacks layer of weak silica accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Concave inset fans emerging onto fan skirts

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Zineb Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—seepage, small stones, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—thin layer

*Gravel:* Improbable source—thin layer

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Interpretive Groups**

*Capability classification:* IVE, irrigated, and VIIs, nonirrigated

*Range site:* 024X005N

## **1682—Zineb-Doowak-Oxcurel association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,800 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Zineb gravelly loam, 0 to 2 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—60 percent
- Doowak very gravelly loamy sand, 0 to 2 percent slopes—Xeric Torriorthents, sandy-skeletal, mixed, mesic—15 percent
- Oxcurel gravelly silt loam, 2 to 4 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 2: Xerollic Camborthids, 0 to 2 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—3 percent
- Inclusion 3: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—2 percent

### **Characteristics of the Zineb Soil**

*Position on landscape:* Fan aprons

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass

### **Typical Profile**

0 to 11 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

11 to 20 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 45 to 75 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-2

- 20 to 45 inches—extremely cobbly loamy coarse sand, extremely cobbly coarse sand; 50 to 75 percent cobbles and stones or 55 to 85 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1
- 45 to 60 inches or more—loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 4.3 to 4.9 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Doowak Soil

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

### Typical Profile

- 0 to 6 inches—very gravelly loamy sand; 5 to 10 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1
- 6 to 60 inches or more—stratified extremely gravelly sand to extremely gravelly loamy sand; 5 to 10 percent cobbles and stones and 75 to 90 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Very rapid  
*Available water capacity:* 1.9 to 3.0 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Oxcorel Soil

*Position on landscape:* Nonburied fan piedmont remnants  
*Parent material:* Mixed alluvium with a thin loess mantle  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

- 0 to 8 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4
- 8 to 34 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 15 to 30); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
- 34 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard to soft, firm to very friable; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 20 inches—very slow; below this depth—moderately rapid  
*Available water capacity:* 4.8 to 6.7 inches  
*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Areas adjacent to channel banks

*Contrasting features:* Gravelly sandy loam throughout the profile; lacks layer of weak silica accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Drainageways on fan aprons

*Contrasting features:* Gravelly loam throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Upper part of inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Zineb soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Doowak soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the Zineb Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—seepage, small stones, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—thin layer

*Gravel:* Improbable source—thin layer

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—seepage, large stones

#### **Ratings of the Doowak Soil for Selected Uses**

*Range seeding:* Poor—too sandy, droughty, small stones

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, too sandy

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Oxcorel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### **Interpretive Groups**

*Capability classification:* Zineb soil—IVs, irrigated, and VIIs, nonirrigated; Doowak soil—VIIs, nonirrigated; Oxcorel soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Zineb soil—024X005N; Doowak soil—024X020N; Oxcorel soil—024X002N

## **2060—Oxcorel-Beoska-Whirlo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Oxcorel very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—40 percent

- Beoska silt loam, 0 to 4 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—30 percent

• Whirlo gravelly loam, 2 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—15 percent  
*Contrasting inclusions:*

• Inclusion 1: Xerollic Camborthids, 15 to 30 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

• Inclusion 2: Typic Torriorthents, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

• Inclusion 3: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Upper summits of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 34 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 34 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 5.0 to 6.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of the Beoska Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Loess over mixed alluvium

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 9 inches—silt loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

9 to 18 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

18 to 60 inches or more—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 18 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 7.5 to 9.4 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Whirlo Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium strongly influenced by loess

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 12 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, GM; estimated AASHTO classification—A-4

12 to 24 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to moderately saline (2 to 8 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1

24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM, GW-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 4.0 to 5.4 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly concave side slopes of fan piedmont remnants

*Contrasting features:* Slopes of 15 to 30 percent

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 2**

*Position on landscape:* Adjacent convex fan skirts

*Contrasting features:* Strongly saline-sodic surface layer

*Distinctive present vegetation:* Shadscale, black greasewood

#### **Inclusion 3**

*Position on landscape:* Areas adjacent to channels

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Oxcorel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium



**Ratings of the Whirlo Soil for Selected Uses***Range seeding:* Poor—too arid*Daily cover for landfill:* Poor—small stones, seepage*Shallow excavations:* Slight*Local roads and streets:* Slight*Roadfill:* Good*Sand:* Probable source*Gravel:* Probable source*Topsoil:* Poor—small stones, area reclaim*Pond reservoir areas:* Severe—seepage*Embankments, dikes, and levees:* Severe—seepage**Interpretive Groups***Capability classification:* Oxcorel soil—IVe, irrigated, and VIIs, nonirrigated; Beoska soil—IVe, irrigated, and VIIs, nonirrigated; Whirlo soil—IVe, irrigated, and VIIs, nonirrigated*Range site:* Oxcorel soil—024X002N; Beoska soil—024X002N; Whirlo soil—024X002N**2061—Oxcorel-Whirlo-Dun Glen association****Map Unit Setting***Position on landscape:* Piedmont slopes*Elevation:* 4,600 to 5,300 feet*Average annual precipitation:* About 7 inches*Average annual air temperature:* About 49 degrees F*Frost-free season:* About 110 days**Composition***Major components:*

- Oxcorel silt loam, 2 to 4 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—40 percent
- Whirlo gravelly loam, 2 to 4 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—30 percent
- Dun Glen gravelly loam, 2 to 4 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, 2 to 4 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—10 percent

**Characteristics of the Oxcorel Soil***Position on landscape:* Fan piedmont remnants*Parent material:* Mixed alluvium with a thin loess mantle*Slope features:* Length—long; shape—smooth*Dominant present vegetation:* Shadscale, bud sagebrush**Typical Profile**

0 to 8 inches—silt loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm);

nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 34 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

**Soil and Water Features***Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* In the upper 34 inches—very slow; below this depth—moderately rapid*Available water capacity:* 5.0 to 6.9 inches*Water-supplying capacity:* 7 inches*Runoff:* Slow*Hydrologic group:* D*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—5*Hazard of erosion:* By water—slight; by wind—slight*Shrink-swell potential:* Moderate*Corrosivity:* To steel—high; to concrete—moderate*Potential frost action:* Low**Characteristics of the Whirlo Soil***Position on landscape:* Fan aprons and inset fan remnants*Parent material:* Mixed alluvium influenced by loess*Slope features:* Length—short; shape—convex*Dominant present vegetation:* Shadscale, bud sagebrush**Typical Profile**

0 to 12 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, GM; estimated AASHTO classification—A-4

12 to 24 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified

classification—GM; estimated AASHTO classification—A-2, A-1

24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.4 to 5.8 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Dun Glen Soil

*Position on landscape:* Fan skirts  
*Parent material:* Mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush  
*Surface cover:* 25 percent pebbles

### Typical Profile

0 to 4 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4, A-2  
 4 to 60 inches or more—fine sandy loam, very fine sandy loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* 6.7 to 7.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Inset fans  
*Contrasting features:* Subject to flash floods  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Dun Glen soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### Ratings of the Oxcorel Soil for Selected Uses

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, too clayey

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### Ratings of the Whirlo Soil for Selected Uses

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Poor—small stones, seepage

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Dun Glen Soil for Selected Uses**

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—small stones  
*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping

#### **Interpretive Groups**

*Capability classification:* Oxcorel soil—Ive, irrigated, and VIIs, nonirrigated; Whirlo soil—Ile, irrigated, and VIIc, nonirrigated; Dun Glen soil—Ile, irrigated, and VIIc, nonirrigated  
*Range site:* Oxcorel soil—024X002N; Whirlo soil—024X002N; Dun Glen soil—024X002N

### **2062—Oxcorel-Orovada association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,600 to 5,000 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Oxcorel gravelly loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—60 percent
- Orovada gravelly very fine sandy loam, 2 to 8 percent slopes, rarely flooded—Durixerollic Camborthids, coarse-loamy, mixed, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Natrargids, 2 to 8 percent slopes—Durixerollic Natrargids, fine, montmorillonitic, mesic—8 percent
- Inclusion 2: Dun Glen very fine sandy loam, 2 to 4 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—7 percent

#### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Fan piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess  
*Slope features:* Length—long; shape—smooth to slightly concave  
*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass, bottlebrush squirreltail

#### **Typical Profile**

- 0 to 5 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4
- 5 to 36 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
- 36 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 36 inches—very slow; below this depth—moderately rapid  
*Available water capacity:* 5.4 to 7.3 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

#### **Characteristics of the Orovada Soil**

*Position on landscape:* Inset fans and fan drainageways  
*Parent material:* Loess influenced by volcanic ash over mixed alluvium  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, small rabbitbrush, bottlebrush squirreltail

#### **Typical Profile**

- 0 to 8 inches—gravelly very fine sandy loam; 25 to 45 percent pebbles (by weight); prismatic structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR

less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4  
 8 to 20 inches—loam, fine sandy loam, very fine sandy loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
 20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* 8.4 to 9.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper margins of fan piedmont remnants  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### Inclusion 2

*Position on landscape:* Adjacent smooth fan skirts  
*Contrasting features:* Lacks layer of weak silica accumulation  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Orovida soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Oxcorel Soil for Selected Uses

*Range seeding:* Poor—too arid, rooting depth, excess sodium  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—too clayey  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, excess sodium, area reclaim  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### Ratings of the Orovida Soil for Selected Uses

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—frost action, flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones  
*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* Oxcorel soil—Ive, irrigated, and VIIs, nonirrigated; Orovida soil—IIIe, irrigated, and VIc, nonirrigated  
*Range site:* Oxcorel soil—024X002N; Orovida soil—024X020N

## 2064—Oxcorel-Misad association

### Map Unit Setting

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,600 to 5,200 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### Composition

*Major components:*

- Oxcorel gravelly very fine sandy loam, 2 to 4 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—60 percent
  - Misad gravelly fine sandy loam, 4 to 8 percent slopes—Durorthidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—25 percent
- Contrasting inclusions:*
- Inclusion 1: Xerollic Camborthids, 2 to 4 percent

slopes—Xerollic Camborthids, sandy-skeletal, mixed, mesic—10 percent

• Inclusion 2: Durixerollic Camborthids, 2 to 4 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bud sagebrush, shadscale, Indian ricegrass

### **Typical Profile**

0 to 5 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM-GM; estimated AASHTO classification—A-4

5 to 20 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

20 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard and soft, firm and very firm; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 20 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 4.8 to 6.7 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Misad Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Bud sagebrush, shadscale, Indian ricegrass

### **Typical Profile**

0 to 7 inches—gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-1, A-2

7 to 31 inches—stratified fine sandy loam to very gravelly sandy loam; 5 to 10 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

31 to 60 inches or more—stratified very gravelly loamy sand to extremely gravelly coarse sandy loam; 5 to 10 percent cobbles and stones and 60 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 2.9 to 4.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Areas adjacent to channels

*Contrasting features:* Receives additional moisture from runoff and flooding

*Distinctive present vegetation:* Spiny hopsage

## **Inclusion 2**

*Position on landscape:* Fan drainageways

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

## **Major Uses**

**Current uses:** Rangeland, wildlife habitat

## **Wildlife habitat elements:**

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Misad soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

## **Ratings of the Oxcorel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

## **Ratings of the Misad Soil for Selected Uses**

*Range seeding:* Poor—too arid, small stones, excess salt

*Daily cover for landfill:* Poor—seepage, small stones, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

## **Interpretive Groups**

*Capability classification:* Oxcorel soil—IVe, irrigated, and VIIs, nonirrigated; Misad soil—IIIe, irrigated, and VIIs, nonirrigated

*Range site:* Oxcorel soil—024X002N; Misad soil—024X002N

## **2065—Oxcorel-Oxcorel, moderately steep-Pineval association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 5,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 105 days

### **Composition**

*Major components:*

- Oxcorel gravelly loam, 4 to 15 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—55 percent
- Oxcorel gravelly loam, 15 to 30 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—15 percent
- Pineval gravelly loam, 8 to 15 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Camborthids, 4 to 15 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—9 percent
- Inclusion 2: Whirlo gravelly very fine sandy loam, 4 to 15 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—6 percent

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4

5 to 36 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

36 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight);

massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 36 inches—very slow; below this depth—moderately rapid  
*Available water capacity:* 5.3 to 7.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Oxcorel, Moderately Steep, Soil**

*Position on landscape:* South-facing side slopes of fan piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush

### **Typical Profile**

0 to 3 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4  
 3 to 30 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7  
 30 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 30 inches—very slow; below this depth—moderately rapid  
*Available water capacity:* 5.1 to 7.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

### **Characteristics of the Pineval Soil**

*Position on landscape:* North-facing side slopes of fan piedmont remnants  
*Parent material:* Gravelly mixed alluvium  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, small rabbitbrush

### **Typical Profile**

0 to 5 inches—gravelly loam; 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, GM-GC; estimated AASHTO classification—A-4  
 5 to 11 inches—very gravelly loam, very gravelly clay loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 11 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly sand; 0 to 25 percent cobbles and stones and 50 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.0 to 4.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave upper inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### **Inclusion 2**

*Position on landscape:* Concave lower inset fans

*Contrasting features:* Lacks layer of clay accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Oxcorel, moderately steep, soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Pineval soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Oxcorel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey, slope

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, area reclaim

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Oxcorel, Moderately Steep, Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Fair—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, area reclaim

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Pineval Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action, slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—area reclaim, small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Oxcorel soil—Ive, irrigated, and VIIs, nonirrigated; Oxcorel, moderately steep, soil—VIIe, nonirrigated; Pineval soil—Ive, irrigated, and VIIs, nonirrigated

*Range site:* Oxcorel soil—024X002N; Oxcorel, moderately steep, soil—024X002N; Pineval soil—024X005N

## **2066—Oxcorel-Broyles-Dun Glen association**

### **Map Unit Setting**

*Position on landscape:* Piedmont slopes

*Elevation:* 4,700 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Oxcorel very fine sandy loam, 2 to 4 percent slopes—



Duric Natrargids, fine, montmorillonitic, mesic—35 percent

- Broyles very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—30 percent

- Dun Glen very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Duric Camborthids, 0 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—8 percent

- Inclusion 2: Xeric Torriorthents, 0 to 2 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

- Inclusion 3: Whirlo cobbly very fine sandy loam, 4 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—2 percent

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 9 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

9 to 36 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

36 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 36 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 5.4 to 7.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of the Broyles Soil**

*Position on landscape:* Fan skirts

*Parent material:* Loess over mixed alluvium

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 11 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

11 to 60 inches or more—stratified loam to gravelly loamy sand; 5 to 40 percent pebbles (by weight); massive; hard, friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 6.3 to 7.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Characteristics of the Dun Glen Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—smooth to slightly concave

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 4 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

4 to 60 inches or more—fine sandy loam, very fine sandy loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 6.7 to 7.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly convex lower margins of fan skirts

*Contrasting features:* Strongly saline-sodic surface layer

*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 2

*Position on landscape:* Areas adjacent to active channels

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Convex fan aprons

*Contrasting features:* Very gravelly substratum

*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential uses:** Rangeland; wildlife habitat; irrigated cropland, if irrigation water is made available

### Wildlife habitat elements:

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Broyles soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Dun Glen soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### Ratings of the Oxcorel Soil for Selected Uses

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### Ratings of the Broyles Soil for Selected Uses

*Range seeding:* Poor—too arid, excess salt

*Daily cover for landfill:* Fair—too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—piping

### Ratings of the Dun Glen Soil for Selected Uses

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

### ***Interpretive Groups***

*Capability classification:* Oxcorel soil—VIIIs, nonirrigated;

Broyles soil—IIs, irrigated, and VIIc, nonirrigated;

Dun Glen soil—IIC, irrigated, and VIIc, nonirrigated

*Range site:* Oxcorel soil—024X002N; Broyles soil—024X002N; Dun Glen soil—024X002N

## **2067—Oxcorel-Colbar-Stingdorn association**

### ***Map Unit Setting***

*Position on landscape:* Hills and interhill fans

*Elevation:* 5,300 to 5,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 105 days

### ***Composition***

*Major components:*

- Oxcorel very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—50 percent
- Colbar cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—20 percent
- Stingdorn cobbly loam, 15 to 30 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—15 percent

*Contrasting inclusions:*

- Inclusion 1: Malpais very cobbly loam, 15 to 30 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—8 percent
- Inclusion 2: Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Durixerollic Camborthids, 2 to 4 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—2 percent

### ***Characteristics of the Oxcorel Soil***

*Position on landscape:* Interhill fan remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### ***Typical Profile***

- 0 to 8 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 8 to 34 inches—clay, clay loam; 0 to 5 percent cobbles

and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

- 34 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### ***Soil and Water Features***

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 34 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 5.4 to 7.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### ***Characteristics of the Colbar Soil***

*Position on landscape:* East- and north-facing side slopes of hills

*Parent material:* Kind—colluvium over residuum; source—rhyolitic rocks

*Slope features:* Length—short; shape—slightly concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, Indian ricegrass, bottlebrush squirreltail

### ***Typical Profile***

- 0 to 3 inches—cobbly loam; 35 to 45 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic

(SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
 26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Stingdorn Soil**

*Position on landscape:* West- and south-facing side slopes of hills  
*Parent material:* Kind—residuum; source—rhyolitic rocks  
*Slope features:* Length—short; shape—slightly concave to convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4  
 7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC; estimated AASHTO classification—A-6  
 15 to 20 inches—indurated duripan; massive  
 20 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 20 inches  
*Depth to bedrock:* 8 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.6 to 2.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* South-facing side slopes of adjacent fan skirt remnants

*Contrasting features:* Deep soils that have a very gravelly loam subsoil

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Slightly concave to smooth, lower inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Concave to smooth, narrow, upper inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Oxcurel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Oxcurel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—too clayey  
*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Fair—droughty, large stones, too arid

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Moderate—large stones, piping

#### **Ratings of the Stingdorn Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, large stones, cemented pan

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Interpretive Groups**

*Capability classification:* Oxcorel soil—VIIIs, nonirrigated; Colbar soil—VIe, nonirrigated; Stingdorn soil—VIIe, nonirrigated

*Range site:* Oxcorel soil—024X002N; Colbar soil—024X005N; Stingdorn soil—024X002N

### **2068—Oxcorel-Golconda-Whirlo association**

#### **Map Unit Setting**

*Position on landscape:* Piedmont slopes

*Elevation:* 4,700 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Oxcorel gravelly very fine sandy loam, 2 to 4 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—50 percent

- Golconda gravelly very fine sandy loam, 2 to 4 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—20 percent

- Whirlo very gravelly very fine sandy loam, 2 to 4 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Broyles silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—6 percent

- Inclusion 2: Xerollic Camborthids, 2 to 4 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

- Inclusion 3: Durixerollic Haplargids, 0 to 2 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—4 percent

#### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Summits of lower fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Indian ricegrass

#### **Typical Profile**

0 to 5 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4

5 to 36 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

36 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH

8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 36 inches—very slow; below this depth—moderately rapid  
*Available water capacity:* 4.4 to 7.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential frost action:* Low

#### **Characteristics of the Golconda Soil**

*Position on landscape:* Summits of upper fan piedmont remnants  
*Parent material:* Loess influenced by volcanic ash over mixed alluvium  
*Slope features:* Length—long; shape—smooth to convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 10 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4  
 10 to 23 inches—clay loam, gravelly clay loam, silty clay loam; 10 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7  
 23 to 36 inches—strongly cemented duripan  
 36 to 60 inches or more—very gravelly loamy coarse sand, very gravelly sandy loam; 50 to 75 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 4.2 to 5.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

#### **Characteristics of the Whirlo Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Mixed alluvium influenced by loess  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 12 inches—very gravelly very fine sandy loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.1); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, GM; estimated AASHTO classification—A-4  
 12 to 24 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
 24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 4.7 to 5.9 inches  
*Water-supplying capacity:* 7 inches

*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower part of inset fan remnants  
*Contrasting features:* Coarse-loamy throughout the profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Concave, active inset fans  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 3**

*Position on landscape:* Inset fans remnants  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Golconda soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Oxcorel Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess sodium  
*Daily cover for landfill:* Poor—small stones, cemented pan, seepage  
*Shallow excavations:* Moderate—too clayey  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Golconda Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—area reclaim, seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, seepage

#### **Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Poor—small stones, seepage

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim, excess salt

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Oxcorel soil—IVe, irrigated, and VIIs, nonirrigated; Golconda soil—IVe, irrigated, and VIIs, nonirrigated; Whirlo soil—Ile, irrigated, and VIIc, nonirrigated

*Range site:* Oxcorel soil—024X002N; Golconda soil—024X002N; Whirlo soil—024X002N

## **2069—Oxcorel-Rednik-Veta association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,600 to 5,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Oxcorel gravelly silt loam, 4 to 8 percent slopes—

Duric Natrargids, fine, montmorillonitic, mesic—40 percent

- Rednik very gravelly sandy loam, 8 to 15 percent slopes—Typic Haplargids, loamy-skeletal, mixed, mesic—25 percent
- Veta very gravelly fine sandy loam, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 4 to 15 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 2: Xerollic Haplargids, 8 to 15 percent slopes—Xerollic Haplargids, clayey-skeletal, mixed, mesic—5 percent
- Inclusion 3: Typic Haplargids, 4 to 15 percent slopes—Typic Haplargids, fine-loamy, mixed, mesic—5 percent

### **Characteristics of the Oxcorel Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

- 0 to 5 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4
- 5 to 20 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
- 20 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard and soft, firm and very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 20 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 4.8 to 6.7 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Characteristics of the Rednik Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

- 0 to 5 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 5 to 16 inches—very gravelly sandy loam, extremely gravelly loam, very gravelly sandy clay loam; 5 to 30 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; hard, friable; strongly alkaline (pH 8.9); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 16 to 47 inches—very gravelly sandy loam; very gravelly fine sandy loam; 5 to 30 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 47 to 60 inches or more—very gravelly sand, extremely gravelly loamy sand; 5 to 30 percent cobbles and stones and 40 to 75 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GP, GP-GM, SP-SM, GM; estimated AASHTO classification—A-1



### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 16 inches—moderately slow; below this depth—very rapid  
*Available water capacity:* 2.0 to 3.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Veta Soil

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass, bottlebrush squirreltail  
*Surface cover:* 25 percent pebbles, 5 percent cobbles

### Typical Profile

0 to 4 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1  
 4 to 20 inches—very gravelly sandy loam, extremely gravelly loam; 10 to 30 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
 20 to 60 inches or more—stratified extremely gravelly loamy sand to very gravelly loam; 10 to 25 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid

*Available water capacity:* 2.5 to 5.0 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fan aprons  
*Contrasting features:* Rapid permeability throughout the profile, receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Fan drainageways  
*Contrasting features:* Receives additional moisture from runoff, very gravelly clay loam subsoil  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Upper margins of fan piedmont remnants  
*Contrasting features:* Clay loam subsoil  
*Distinctive present vegetation:* shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Rednik soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Veta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Oxcorel Soil for Selected Uses

*Range seeding:* Poor—too arid, rooting depth, excess sodium  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—too clayey  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, excess sodium, area reclaim  
*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Rednik Soil for Selected Uses**

*Range seeding:* Poor—too arid, small stones, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones, slope

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Veta Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—seepage, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Oxcorel soil—IVe, irrigated, and VIIs, nonirrigated; Rednik soil—VIIs, nonirrigated; Veta soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Oxcorel soil—024X002N; Rednik soil—024X002N; Veta soil—024X005N

### **2090—Punchbowl-Robson-Reluctan association**

#### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,200 to 7,400 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 90 days

#### **Composition**

*Major components:*

- Punchbowl cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—50 percent
- Robson very cobbly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—20 percent
- Reluctan very cobbly loam, 30 to 50 percent slopes—

Aridic Argixerolls, fine-loamy, mixed, frigid—15 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Xerollic Haplargids, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey, montmorillonitic, frigid—6 percent
- Inclusion 2: Rock outcrop—6 percent
- Inclusion 3: Aridic Argixerolls, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—3 percent

#### **Characteristics of the Punchbowl Soil**

*Position on landscape:* South-facing summits, shoulders, and side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, Sandberg bluegrass, small rabbitbrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 3 inches—cobbly loam; 25 to 40 percent cobbles and stones and 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

3 to 7 inches—gravelly loam, loam; 0 to 5 percent cobbles and stones and 5 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6

7 to 11 inches—gravelly clay loam, gravelly sandy clay loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

11 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.2 to 1.6 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Robson Soil**

*Position on landscape:* West-facing side slopes of mountains

*Parent material:* Kind—residuum; source—chert and shale

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, small rabbitbrush, black sagebrush

### **Typical Profile**

0 to 10 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, SM-SC, SC; estimated AASHTO classification—A-2

10 to 14 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-7

14 to 19 inches—very cobbly clay, extremely cobbly clay; 50 to 80 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 0.9 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Reluctan Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—rhyolitic rocks

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Sandberg bluegrass, Idaho fescue, balsamroot

### **Typical Profile**

0 to 8 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 40 to 55 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4, A-2

8 to 33 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

33 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.5 to 7.4 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests of mountains

*Contrasting features:* Clay subsoil

*Distinctive present vegetation:* Black sagebrush, low sagebrush

#### **Inclusion 2**

*Position on landscape:* Scattered peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

**Inclusion 3**

*Position on landscape:* North- and west-facing back slopes of mountains

*Contrasting features:* Bedrock at a depth of more than 40 inches

*Distinctive present vegetation:* Black sagebrush, Idaho fescue

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Punchbowl soil for named elements:*

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Robson soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Reluctan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Punchbowl Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Robson Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Reluctan Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Punchbowl soil—VIIIs, nonirrigated; Robson soil—VIIIs, nonirrigated; Reluctan soil—VIIIs, nonirrigated

*Range site:* Punchbowl soil—024X030N; Robson soil—024X018N; Reluctan soil—024X021N

**2091—Punchbowl-Teguro-Sumine association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,300 to 7,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 90 days

**Composition**

*Major components:*

- Punchbowl very gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—35 percent
  - Teguro very gravelly loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy, mixed, frigid—25 percent
  - Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—25 percent
- Contrasting inclusions:*
- Inclusion 1: Aridic Argixerolls, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 2: Cumulic Haploxerolls, 2 to 8 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 3: Rubble land—3 percent
  - Inclusion 4: Rock outcrop—2 percent

**Characteristics of the Punchbowl Soil**

*Position on landscape:* South- and west-facing shoulders and side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, bluebunch wheatgrass, pine bluegrass, small rabbitbrush

### Typical Profile

- 0 to 3 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 3 to 7 inches—gravelly loam, loam; 0 to 5 percent cobbles and stones and 5 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6
- 7 to 11 inches—gravelly clay loam, gravelly sandy clay loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7
- 11 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 8 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.2 to 1.6 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Teguro Soil

*Position on landscape:* Crests and upper side slopes of mountains  
*Parent material:* Kind—residuum; source—tuff  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Utah juniper, Idaho fescue, mountain big sagebrush, pine bluegrass, singleleaf pinyon  
*Surface cover:* 55 percent pebbles

### Typical Profile

- 0 to 4 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles

(by weight); platy structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

- 4 to 16 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, AS-6

16 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.0 to 2.6 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Sumine Soil

*Position on landscape:* North- and east-facing side slopes of mountains  
*Parent material:* Kind—colluvium over residuum; source—breccia and quartzite  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue, bluegrass, arrowleaf balsamroot

### Typical Profile

- 0 to 6 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
- 6 to 28 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC;

estimated AASHTO classification—A-2, A-6, A-7  
28 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.8 to 4.1 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly concave, north-facing side slopes of mountains  
*Contrasting features:* Slopes of 50 to 75 percent  
*Distinctive present vegetation:* Idaho fescue, Utah juniper

#### Inclusion 2

*Position on landscape:* Concave drainageways, below springs, and along canyon bottoms of mountains  
*Contrasting features:* Deep soils that have a thick, dark colored surface layer  
*Distinctive present vegetation:* Basin wildrye, bluegrass, basin big sagebrush

#### Inclusion 3

*Position on landscape:* Scree slopes below rock outcrop  
*Contrasting features:* More than 90 percent stones on the surface  
*Distinctive present vegetation:* Barren

#### Inclusion 4

*Position on landscape:* Rimrock and shoulder slopes of mountains  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Woodland on the Teguro soil:

*Site index for common trees:* Singleleaf pinyon—45; Utah juniper—45  
*Most important native understory plants:* Idaho fescue, mountain big sagebrush, serviceberry, oceanspray, bluegrass

### Wildlife habitat elements:

*Suitability of the Punchbowl soil for named elements:*

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Teguro soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Punchbowl Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Teguro Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Sumine Soil for Selected Uses

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Punchbowl soil—VIIIs,

nonirrigated; Teguro soil—VIIIs, nonirrigated;  
Sumine soil—VIIIs, nonirrigated

*Range site:* Punchbowl soil—024X030N; Teguro soil—  
025X062N; Sumine soil—024X029N

*Woodland suitability group:* Teguro soil—1R

## 2092—Punchbowl-Belate-Reluctan association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,400 to 7,700 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 75 days

### Composition

*Major components:*

- Punchbowl gravelly loam, 30 to 50 percent slopes—  
Lithic Xerollic Haplargids, loamy, mixed, frigid—50  
percent
- Belate very gravelly loam, 30 to 50 percent slopes—  
Aridic Argixerolls, loamy-skeletal, mixed, frigid—20  
percent
- Reluctan very gravelly loam, 15 to 30 percent  
slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—15  
percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—6 percent
- Inclusion 2: Xerollic Haplargids, 15 to 50 percent  
slopes—Xerollic Haplargids, loamy-skeletal, mixed,  
frigid—4 percent
- Inclusion 3: Durixerollic Camborthids, 8 to 15 percent  
slopes—Durixerollic Camborthids, loamy-skeletal,  
mixed, frigid—3 percent
- Inclusion 4: Rubble land—2 percent

### Characteristics of the Punchbowl Soil

*Position on landscape:* Crests, shoulders, and upper  
side slopes of mountains

*Parent material:* Kind—residuum; source—andesite and  
rhyolite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small  
rabbitbrush, bluegrass, singleleaf pinyon, Utah  
juniper

### Typical Profile

0 to 3 inches—gravelly loam; 5 to 10 percent cobbles  
and stones and 25 to 40 percent pebbles (by  
weight); platy structure; slightly hard, very friable;  
mildly alkaline (pH 7.6); nonsaline (less than 2  
mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—SM; estimated AASHTO  
classification—A-4, A-2

3 to 6 inches—gravelly loam, loam; 0 to 5 percent  
cobbles and stones and 5 to 35 percent pebbles (by  
weight); subangular blocky structure; slightly hard,  
friable; mildly alkaline (pH 7.8); nonsaline (less than  
2 mmhos/cm); nonsodic (SAR less than 2);  
estimated Unified classification—SC, CL, GC;  
estimated AASHTO classification—A-6

6 to 10 inches—gravelly clay loam, gravelly sandy clay  
loam; 0 to 5 percent cobbles and stones and 40 to  
50 percent pebbles (by weight); angular blocky  
structure; hard, friable; moderately alkaline (pH 8.2);  
nonsaline (less than 2 mmhos/cm); nonsodic (SAR  
less than 2); estimated Unified classification—GC;  
estimated AASHTO classification—A-6, A-7

10 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.2 to 1.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—  
1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Belate Soil

*Position on landscape:* North-facing side slopes of  
mountains

*Parent material:* Kind—colluvium; source—ash flow tuffs  
and andesite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, small  
rabbitbrush, bluegrass, Idaho fescue

### Typical Profile

0 to 14 inches—very gravelly loam; 5 to 15 percent  
cobbles and stones and 50 to 65 percent pebbles  
(by weight); subangular blocky structure; slightly  
hard, friable; neutral (pH 7.0); nonsaline (less than  
2 mmhos/cm); nonsodic (SAR less than 2);  
estimated Unified classification—GM-GC; estimated  
AASHTO classification—A-2

14 to 60 inches or more—very gravelly loam, very  
gravelly clay loam; 5 to 10 percent cobbles and  
stones and 50 to 65 percent pebbles (by weight);

angular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 6.9 to 8.6 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Reluctant Soil

*Position on landscape:* Lower side slopes of mountains  
*Parent material:* Kind—gravely colluvium over residuum; source—rhyolitic rocks  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, pine bluegrass, Idaho fescue

### Typical Profile

0 to 8 inches—very gravelly loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4, A-2  
 8 to 33 inches—gravely clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7  
 33 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.4 to 4.6 inches  
*Water-supplying capacity:* 12 inches

*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered peaks of mountains  
*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Convex lower side slopes of mountains  
*Contrasting features:* Deep soils that have a thin surface layer

*Distinctive present vegetation:* Black sagebrush

#### Inclusion 3

*Position on landscape:* Foot slopes of mountains  
*Contrasting features:* Deep soils that receive additional moisture from runoff  
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### Inclusion 4

*Position on landscape:* Rock stringers on side slopes of mountains  
*Contrasting features:* More than 90 percent stones on the surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Punchbowl soil for named elements:*  
 Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Belate soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Reluctant soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Punchbowl Soil for Selected Uses

*Range seeding:* Poor—droughty, erodes easily  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope



*Roadfill:* Poor—slope, depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Belate Soil for Selected Uses**

*Range seeding:* Poor—small stones, erodes easily  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Slight

#### **Ratings of the Reluctan Soil for Selected Uses**

*Range seeding:* Poor—small stones  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Punchbowl soil—VIIe, nonirrigated; Belate soil—VIIs, nonirrigated; Reluctan soil—VIIs, nonirrigated  
*Range site:* Punchbowl soil—024X030N; Belate soil—024X027N; Reluctan soil—024X021N

### **2094—Punchbowl-Jung-Locane association**

#### **Map Unit Setting**

*Position on landscape:* Hills  
*Elevation:* 6,300 to 7,000 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 90 days

#### **Composition**

##### *Major components:*

- Punchbowl very gravelly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—35 percent
- Jung very cobbly loam, 8 to 30 percent slopes—Lithic

Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—30 percent

- Locane very gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—20 percent

##### *Contrasting inclusions:*

- Inclusion 1: Rock outcrop—6 percent
- Inclusion 2: Durixerollic Camborthids, 4 to 15 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Lithic Natrargids, 15 to 50 percent slopes—Lithic Natrargids, clayey-skeletal, montmorillonitic, mesic—4 percent

#### **Characteristics of the Punchbowl Soil**

*Position on landscape:* Lower north- and upper east- and west-facing side slopes of hills

*Parent material:* Kind—residuum; source—ash flow tuffs

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, bottlebrush squirreltail, bluegrass, small rabbitbrush, singleleaf pinyon

#### **Typical Profile**

- 0 to 3 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 3 to 7 inches—gravelly loam, loam; 0 to 5 percent cobbles and stones and 5 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6
- 7 to 11 inches—gravelly clay loam, gravelly sandy clay loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7
- 11 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.2 to 1.6 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Jung Soil**

*Position on landscape:* South- and lower east- and west-facing side slopes of hills

*Parent material:* Kind—residuum; source—ash flow tuffs

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, bottlebrush squirreltail, small rabbitbrush, ephedra

### **Typical Profile**

0 to 8 inches—very cobbly loam; 35 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

8 to 19 inches—very cobbly clay loam, very gravelly clay loam, very cobbly clay; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; very hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Locane Soil**

*Position on landscape:* Upper, north-facing side slopes of hills

*Parent material:* Kind—residuum; source—tuffaceous conglomerate

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, bluegrass

### **Typical Profile**

0 to 6 inches—very gravelly loam; 5 to 15 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

6 to 14 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 1.4 to 1.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered peaks of hills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Foot slopes of hills

*Contrasting features:* Very deep

*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

#### **Inclusion 3**

*Position on landscape:* Slightly concave, south-facing side slopes of hills

*Contrasting features:* Sodium-affected layer of clay accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush, small rabbitbrush, bottlebrush squirreltail

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Punchbowl soil for named elements:*  
Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Jung soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Locane soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Punchbowl Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Jung Soil for Selected Uses

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### Ratings of the Locane Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Punchbowl soil—VIIIs, nonirrigated; Jung soil—VIIIs, nonirrigated; Locane soil—VIIIs, nonirrigated

*Range site:* Punchbowl soil—024X030N; Jung soil—028B016N; Locane soil—028B010N

## 2098—Punchbowl-Clan Alpine-Sumine association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 7,000 to 7,600 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 90 days

### Composition

#### Major components:

- Punchbowl cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—40 percent
  - Clan Alpine very cobbly loam, 30 to 50 percent slopes—Typic Argixerolls, loamy-skeletal, mixed, frigid—30 percent
  - Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—15 percent
- Contrasting inclusions:*
- Inclusion 1: Xerollic Haplargids, 15 to 30 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—7 percent
  - Inclusion 2: Rock outcrop—4 percent
  - Inclusion 3: Lithic Argixerolls, 15 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—3 percent
  - Inclusion 4: Rubble land—1 percent

### Characteristics of the Punchbowl Soil

*Position on landscape:* Lower, south- and west-facing crests and side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolitic tuffs and andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, Sandberg bluegrass, phlox, singleleaf pinyon

### Typical Profile

0 to 3 inches—cobbly loam; 25 to 40 percent cobbles

and stones and 15 to 30 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

3 to 7 inches—gravelly loam, loam; 0 to 5 percent cobbles and stones and 5 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6

7 to 11 inches—gravelly clay loam, gravelly sandy clay loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

11 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.2 to 1.6 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Clanalpine Soil**

*Position on landscape:* North- and west-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—rhyolitic and andesite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, mountainmahogany, bluegrass, Idaho fescue

#### **Typical Profile**

0 to 12 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

12 to 38 inches—very cobbly clay loam, very cobbly loam, very gravelly clay loam; 15 to 35 percent cobbles and stones and 40 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

38 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.2 to 4.8 inches

*Water-supplying capacity:* 14 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Sumine Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—very gravelly colluvium over residuum; source—breccia and quartzite

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, Thurber needlegrass, bluegrass, Idaho fescue

#### **Typical Profile**

0 to 6 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

6 to 28 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC;

estimated AASHTO classification—A-2, A-6, A-7  
28 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.8 to 4.1 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex, upper, south- and west-facing side slopes of mountains  
*Contrasting features:* Bedrock at a depth of 40 to 60 inches; lacks a dark colored surface layer  
*Distinctive present vegetation:* Black sagebrush, singleleaf pinyon

#### Inclusion 2

*Position on landscape:* Random small peaks and ridges of mountains  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

#### Inclusion 3

*Position on landscape:* Upper crests and shoulder slopes of mountains  
*Contrasting features:* Bedrock at a depth of 10 to 20 inches; thick, dark colored surface layer  
*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper

#### Inclusion 4

*Position on landscape:* Rock stringers on side slopes of mountains  
*Contrasting features:* More than 90 percent stones on the surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Woodland on the Clanalpine soil:

*Site index for common trees:* Singleleaf pinyon—75; Utah juniper—75

*Most important native understory plants:* Mountain big sagebrush, Idaho fescue, bluegrass, lupine, phlox, arrowleaf balsamroot

### Wildlife habitat elements:

*Suitability of the Punchbowl soil for named elements:*

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Clanalpine soil for named elements:*

Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Punchbowl Soil for Selected Uses

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Clanalpine Soil for Selected Uses

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

### Ratings of the Sumine Soil for Selected Uses

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### ***Interpretive Groups***

*Capability classification:* Punchbowl soil—VIIIs, nonirrigated; Clanalpine soil—VIIIs, nonirrigated; Sumine soil—VIIIs, nonirrigated

*Range site:* Punchbowl soil—024X030N; Clanalpine soil—025X061N; Sumine soil—024X029N

*Woodland suitability group:* Clanalpine soil—2R

## **2099—Punchbowl-Roca-Rock outcrop association**

### ***Map Unit Setting***

*Position on landscape:* Mountains

*Elevation:* 6,200 to 7,400 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 90 days

### ***Composition***

*Major components:*

- Punchbowl very gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—45 percent
- Roca very cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—25 percent
- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Xeric Torriorthents, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, frigid—6 percent
- Inclusion 2: Xerollic Durargids, 15 to 30 percent slopes—Xerollic Durargids, loamy, mixed, frigid, shallow—6 percent
- Inclusion 3: Typic Haploxerolls, 30 to 50 percent slopes—Typic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent
- Inclusion 4: Welch loam drained, 2 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—1 percent

### ***Characteristics of the Punchbowl Soil***

*Position on landscape:* Crests, shoulders, and east- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, Sandberg bluegrass, bottlebrush squirreltail, small rabbitbrush, horsebrush

### ***Typical Profile***

0 to 3 inches—very gravelly loam; 5 to 10 percent

cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—gravelly loam, loam; 0 to 5 percent cobbles and stones and 5 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6

7 to 11 inches—gravelly clay loam, gravelly sandy clay loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

11 inches—unweathered bedrock

### ***Soil and Water Features***

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.2 to 1.6 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### ***Characteristics of the Roca Soil***

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum; source—chert and shale

*Slope features:* Length—long; shape—convex to slightly concave

*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, bluegrass, Thurber needlegrass

### ***Typical Profile***

0 to 5 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles

(by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 27 inches—very gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

27 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Characteristics of Rock Outcrop

*Position on landscape:* Ridges, knobs, and steep side slopes of mountains

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex side slopes of mountains with exposures of interbedded limestone bedrock

*Contrasting features:* Calcareous throughout the profile

*Distinctive present vegetation:* Black sagebrush

#### Inclusion 2

*Position on landscape:* Foot slopes and lower side slopes of mountains

*Contrasting features:* Hardpan at a depth of 10 to 20 inches

*Distinctive present vegetation:* Mountain big sagebrush

#### Inclusion 3

*Position on landscape:* Concave, north-facing side slopes of mountains

*Contrasting features:* Thick, dark colored surface layer

*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue

#### Inclusion 4

*Position on landscape:* Intermountain drainageways

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, western wheatgrass, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Punchbowl soil for named elements:*

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Roca soil for named elements:* Wild

herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Punchbowl Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Roca Soil for Selected Uses

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Punchbowl soil—VIIIs, nonirrigated; Roca soil—VIIs, nonirrigated; Rock outcrop—VIIs

*Range site:* Punchbowl soil—024X030N; Roca soil—024X028N

## 2100—Grassval-Grina-Unsel Variant association

### Map Unit Setting

*Position on landscape:* Fan piedmonts and low rolling hills

*Elevation:* 5,300 to 5,600 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Grassval gravelly loam, 4 to 8 percent slopes—Xerollic Durargids, loamy, mixed, mesic, shallow—35 percent
  - Grina very gravelly loam, 15 to 50 percent slopes, eroded—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—30 percent
  - Unsel Variant very gravelly loam, 30 to 50 percent slopes—Duric Haplargids, fine-loamy, mixed, mesic—20 percent
- Contrasting inclusions:*
- Inclusion 1: Duric Natrargids, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—5 percent
  - Inclusion 2: Durorthidic Torriorthents, 2 to 8 percent slopes—Durorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—4 percent
  - Inclusion 3: Xerollic Haplargids, 15 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—3 percent
  - Inclusion 4: Xeric Torriorthents, 30 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—3 percent

### Characteristics of the Grassval Soil

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail, shadscale

### Typical Profile

0 to 4 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2, A-4

4 to 13 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones and 30 to 45

percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6

13 inches—indurated duripan; massive

### Soil and Water Features

*Depth to hardpan:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Grina Soil

*Position on landscape:* Side slopes of hills adjacent to fan piedmont remnants

*Parent material:* Kind—residuum; source—tuffaceous, weakly consolidated sediments

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Utah juniper, Wyoming big sagebrush, bottlebrush squirreltail, black sagebrush, singleleaf pinyon

### Typical Profile

0 to 3 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

3 to 14 inches—loam, silty clay loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

14 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches



*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.7 to 2.5 inches  
*Water-supplying capacity:* 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Unsel Variant Soil**

*Position on landscape:* Side slopes of hills adjacent to south-facing side slopes of fan piedmont remnants  
*Parent material:* Kind—residuum and colluvium; source—tuffaceous, weakly consolidated sediments  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, small rabbitbrush  
*Surface cover:* 45 percent pebbles, 15 percent cobbles

### **Typical Profile**

0 to 2 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
 2 to 15 inches—gravelly loam; 30 to 45 percent pebbles (by weight); angular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC; estimated AASHTO classification—A-6, A-7  
 15 to 22 inches—gravelly loam; 30 to 45 percent pebbles (by weight); massive; hard, firm; very strongly alkaline (pH 9.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, SC; estimated AASHTO classification—A-4, A-6  
 22 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.8 to 3.5 inches  
*Water-supplying capacity:* 7 inches

*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower fan piedmont remnants  
*Contrasting features:* Deep soils that have a clayey subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Inset fans  
*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 3**

*Position on landscape:* North-facing shoulders and upper side slopes of fan piedmont remnants

*Contrasting features:* Very gravelly subsoil

*Distinctive present vegetation:* Black sagebrush

#### **Inclusion 4**

*Position on landscape:* Eroded side slopes of fan piedmont remnants with a rock core

*Contrasting features:* Bedrock within a depth of 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, black sagebrush

*Other inclusions (of minor extent):* Rock outcrop occurs in random spots on side slopes of fan piedmont remnants

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Woodland on the Grina soil:**

*Site index for common trees:* Singleleaf pinyon—18; Utah juniper—18

*Most important native understory plants:* Big sagebrush, bluebunch wheatgrass, basin wildrye, Thurber needlegrass, Indian ricegrass, bluegrass, tapertip hawksbeard

#### **Wildlife habitat elements:**

*Suitability of the Grassval soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Grina soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous

plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Unsel Variant soil for named elements:*

Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Grassval Soil for Selected Uses**

*Range seeding:* Poor—droughty, cemented pan

*Daily cover for landfill:* Poor—cemented pan, small stones

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Grina Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, slope

*Roadfill:* Poor—depth to bedrock, slope, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, depth to bedrock

*Pond reservoir areas:* Severe—slope, depth to bedrock

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Unsel Variant Soil for Selected Uses**

*Range seeding:* Poor—too arid, small stones

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Severe—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Grassval soil—VIIs, nonirrigated; Grina soil—VIIs, nonirrigated; Unsel Variant soil—VIIs, nonirrigated

*Range site:* Grassval soil—024X030N; Grina soil—025X059N; Unsel Variant soil—024X002N

*Woodland suitability group:* Grina soil—1R

### **2104—Grassval-Zineb-Izod association**

#### **Map Unit Setting**

*Position on landscape:* Piedmont slopes

*Elevation:* 5,800 to 6,500 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 105 days

#### **Composition**

*Major components:*

- Grassval very gravelly sandy loam, 4 to 15 percent slopes—Xerollic Durargids, loamy, mixed, mesic, shallow—55 percent
- Zineb gravelly very fine sandy loam, 4 to 15 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—15 percent
- Izod cobbly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Xeric Torriorthents, warm, 15 to 50 percent slopes—Durorthidic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—7 percent
- Inclusion 2: Durorthidic Xeric Torriorthents, cool, 15 to 50 percent slopes—Durorthidic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 3: Xeric Torriorthents, 4 to 15 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—3 percent

#### **Characteristics of the Grassval Soil**

*Position on landscape:* Summits of fan piedmont remnants overplacing rock pediments

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth to convex

*Dominant present vegetation:* Black sagebrush, bottlebrush squirreltail, ephedra, Utah juniper, singleleaf pinyon

#### **Typical Profile**

- 0 to 4 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
- 4 to 13 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6
- 13 inches—indurated duripan; massive

### Soil and Water Features

*Depth to hardpan:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.5 to 1.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Zineb Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bottlebrush squirreltail, pine bluegrass

### Typical Profile

0 to 6 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

6 to 13 inches—gravelly very fine sandy loam, gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

13 to 19 inches—very gravelly sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 55 to 75 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1

19 to 27 inches—extremely cobbly sandy loam; 50 to 75 percent cobbles and stones or 55 to 85 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated

Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

27 to 60 inches or more—extremely cobbly loamy coarse sand, extremely cobbly coarse sand; 50 to 75 percent cobbles and stones or 55 to 85 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP, GM-GC; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 4.3 to 4.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Izod Soil

*Position on landscape:* Side slopes of rock pediment remnants

*Parent material:* Kind—residuum; source—interbedded shale and limestone

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

### Typical Profile

0 to 4 inches—cobbly loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, CL-ML, ML; estimated AASHTO classification—A-4

4 to 10 inches—very gravelly loam, extremely gravelly loam; 0 to 25 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2

10 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 7 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 0.4 to 0.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Colluvial side slopes of rock pediment remnants  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Black sagebrush, small rabbitbrush

**Inclusion 2**

*Position on landscape:* Higher elevation summits and north-facing side slopes of rock pediment remnants  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper

**Inclusion 3**

*Position on landscape:* Areas adjacent to concave channels of inset fans  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Grassval soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Zineb soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Izod soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Grassval Soil for Selected Uses**

*Range seeding:* Poor—droughty, cemented pan, small stones

*Daily cover for landfill:* Poor—cemented pan, small stones

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Zineb Soil for Selected Uses**

*Range seeding:* Fair—droughty

*Daily cover for landfill:* Poor—small stones, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action, large stones, slope

*Roadfill:* Fair—large stones

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Izod Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Grassval soil—VIIs, nonirrigated; Zineb soil—IVe, irrigated, and VIIs, nonirrigated; Izod soil—VIIs, nonirrigated

*Range site:* Grassval soil—024X030N; Zineb soil—024X005N; Izod soil—024X030N

**2521—Stingdorn very cobbly loam, 4 to 30 percent slopes****Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,200 to 5,800 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Stingdorn very cobbly loam, 4 to 30 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—85 percent

#### Contrasting inclusions:

- Inclusion 1: Xerollic Durargids, 4 to 15 percent slopes—Xerollic Durargids, loamy-skeletal, mixed, mesic, shallow—8 percent
- Inclusion 2: Chiara cobbly loam, 2 to 8 percent—Xerollic Durorthids, loamy, mixed, mesic, shallow—5 percent
- Inclusion 3: Rock outcrop—2 percent

### Characteristics of the Stingdorn Soil

*Position on landscape:* Crests, shoulders, and side slopes of foothills

*Parent material:* Kind—residuum; source—ash flow tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, small rabbitbrush, littleleaf horsebrush, bottlebrush squirreltail

*Surface cover:* 5 percent pebbles, 40 percent cobbles

### Typical Profile

0 to 7 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2, A-4

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-6

15 to 20 inches—indurated duripan; massive

20 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 8 to 20 inches

*Depth to bedrock:* 8 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.5 to 1.9 inches

*Water-supplying capacity:* 6 inches

*Runoff:* Medium or rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly concave, north-facing side slopes of foothills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass, small rabbitbrush

#### Inclusion 2

*Position on landscape:* Interhill fans adjacent to foothills

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

#### Inclusion 3

*Position on landscape:* Random small peaks and ridges of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### Major Uses

*Current uses:* Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### Ratings of the Soil for Selected Uses

*Range seeding:* Poor—too arid, droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, large stones, cemented pan

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

*Range site:* 024X002N

**2522—Stingdorn-Stingdorn, steep-Colbar association****Map Unit Setting***Position on landscape:* Foothills*Elevation:* 5,000 to 5,500 feet*Average annual precipitation:* About 8 inches*Average annual air temperature:* About 48 degrees F*Frost-free season:* About 110 days**Composition***Major components:*

- Stingdorn cobbly loam, 15 to 30 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—40 percent
- Stingdorn extremely cobbly loam, 30 to 50 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—30 percent
- Colbar very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: McVegas very cobbly loam, 15 to 30 percent slopes—Haplic Nadurargids, clayey-skeletal, montmorillonitic, mesic, shallow—5 percent
- Inclusion 2: Durixerollic Camborthids, 8 to 15 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—4 percent
- Inclusion 3: Rock outcrop—1 percent

**Characteristics of the Stingdorn Soil***Position on landscape:* Crests and upper side slopes of foothills*Parent material:* Kind—residuum; source—rhyolitic ash-flow tuff*Slope features:* Length—short; shape—convex*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, small rabbitbrush**Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC; estimated AASHTO classification—A-6

15 to 20 inches—indurated duripan; massive  
20 inches—unweathered bedrock

**Soil and Water Features***Depth to hardpan:* 8 to 20 inches*Depth to bedrock:* 8 to 20 inches*Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* Moderately slow*Available water capacity:* 1.5 to 1.9 inches*Water-supplying capacity:* 7 inches*Runoff:* Rapid*Hydrologic group:* D*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6*Hazard of erosion:* By water—moderate; by wind—slight*Shrink-swell potential:* Low*Corrosivity:* To steel—high; to concrete—low*Potential frost action:* Low**Characteristics of the Stingdorn, Steep, Soil***Position on landscape:* South-facing side slopes of foothills*Parent material:* Kind—residuum; source—rhyolitic ash-flow tuff*Slope features:* Length—long; shape—convex*Dominant present vegetation:* Wyoming big sagebrush, shadscale, spiny hopsage, small rabbitbrush, bottlebrush squirreltail**Typical Profile**

0 to 7 inches—extremely cobbly loam; 50 to 60 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-2, A-1

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-6

15 to 20 inches—indurated duripan; massive  
20 inches—unweathered bedrock

**Soil and Water Features***Depth to hardpan:* 8 to 20 inches*Depth to bedrock:* 8 to 20 inches*Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—colluvium over residuum; source—ash flow tuffs

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, spiny hopsage, pine bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.3 to 3.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly concave foot slopes of foothills

*Contrasting features:* Sodium-affected layer of clay accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Adjacent concave alluvial fans

*Contrasting features:* Very deep soil

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass

#### **Inclusion 3**

*Position on landscape:* Crests and eroded side slopes of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Stingdorn, steep, soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Stingdorn Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, large stones, cemented pan

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Stingdorn, Steep, Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, large stones

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, slope, large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, cemented pan

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Interpretive Groups**

*Capability classification:* Stingdorn, soil—VIIe, nonirrigated; Stingdorn, steep, soil—VIIs, nonirrigated; Colbar soil—VIIs, nonirrigated

*Range site:* Stingdorn soil—024X002N; Stingdorn, steep, soil—024X002N; Colbar soil—024X005N

### **2530—Perwick-Puett-Tulase association**

#### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,200 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Perwick very gravelly loam, 15 to 50 percent slopes,

eroded—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—40 percent

- Puett gravelly loam, 15 to 50 percent slopes, eroded—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—30 percent

- Tulase silt loam, 2 to 8 percent slopes—Durorthidic Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Pineval gravelly loam, 4 to 15 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—10 percent

- Inclusion 2: Rock outcrop—5 percent

#### **Characteristics of the Perwick Soil**

*Position on landscape:* Mid and lower side slopes of foothills

*Parent material:* Kind—residuum; source—tuffaceous sedimentary rocks

*Slope features:* Length—short; shape—slightly convex to slightly concave

*Dominant present vegetation:* Utah juniper, Wyoming big sagebrush, black sagebrush, small rabbitbrush

#### **Typical Profile**

- 0 to 3 inches—very gravelly loam; 50 to 60 percent pebbles (by weight); granular structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2
- 3 to 16 inches—gravelly sandy loam, gravelly loam, gravelly silt loam; 25 to 50 percent pebbles (by weight); granular structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4
- 16 to 26 inches—fine sandy loam, sandy loam, loam; 10 to 20 percent pebbles (by weight); massive; very hard, very firm; very strongly alkaline (pH 9.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4
- 26 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 3.2 to 3.9 inches

*Water-supplying capacity:* 8 inches



*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Puett Soil**

*Position on landscape:* Eroded, upper side slopes of foothills  
*Parent material:* Kind—residuum; source—weathered tuff and semiconsolidated lake sediments  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, Wyoming big sagebrush, Indian ricegrass, Utah juniper

### **Typical Profile**

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4  
 3 to 10 inches—coarse sandy loam, gravelly sandy loam, loam; 10 to 50 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML, GM; estimated AASHTO classification—A-1, A-2, A-4  
 10 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 1.2 to 1.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Tulase Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, basin wildrye, Sandberg bluegrass

### **Typical Profile**

0 to 6 inches—silt loam; platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 6 to 60 inches or more—silt loam, very fine sandy loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 8.8 to 12.2 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Adjacent fan piedmont remnants  
*Contrasting features:* Very deep  
*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Crests and eroded side slopes of foothills  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Woodland on the Perwick soil:**

*Site index for common trees:* Utah juniper—18  
*Most important native understory plants:* Wyoming big sagebrush, bluebunch wheatgrass, basin wildrye, Thurber needlegrass, Indian ricegrass, bluegrass

**Woodland on the Puett soil:**

*Site index for common trees:* Utah juniper—18

*Most important native understory plants:* Wyoming big sagebrush, antelope bitterbrush, bottlebrush squirreltail, Indian ricegrass, bluegrass

**Wildlife habitat elements:**

*Suitability of the Perwick soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

*Suitability of the Puett soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—very poor; shrubs (nonirrigated)—poor

*Suitability of the Tulase soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Perwick Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

**Ratings of the Puett Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—seepage, piping

**Ratings of the Tulase Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

**Interpretive Groups**

*Capability classification:* Perwick soil—VIIIs, nonirrigated; Puett soil—VIIe, nonirrigated; Tulase soil—IIIe, irrigated, and VIc, nonirrigated

*Range site:* Perwick soil—025X059N; Puett soil—025X059N; Tulase soil—024X005N

*Woodland suitability group:* Perwick soil—1R; Puett soil—1R

**2540—Buffaran-Wieland association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,700 to 6,300 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Buffaran cobbly loam, 2 to 8 percent slopes—Xerollic Durargids, clayey, montmorillonitic, mesic, shallow—50 percent
- Wieland gravelly loam, 8 to 15 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 4 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—6 percent
- Inclusion 2: Xerollic Haplargids, 2 to 8 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—4 percent

**Characteristics of the Buffaran Soil**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

*Surface cover:* 25 percent pebbles, 5 percent cobbles

**Typical Profile**

0 to 4 inches—cobbly loam; 15 to 30 percent cobbles and stones and 15 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL; estimated AASHTO classification—A-6

- 4 to 15 inches—gravelly clay loam, gravelly clay, clay; 0 to 5 percent cobbles and stones and 15 to 30 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
- 15 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.6 to 2.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Wieland Soil

*Position on landscape:* Side slopes of fan piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—short; concave to convex  
*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

### Typical Profile

- 0 to 8 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6
- 8 to 20 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CH, SC; estimated AASHTO classification—A-7
- 20 to 60 inches or more—loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); massive;

hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4, A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 5.7 to 9.2 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave to smooth inset fans  
*Contrasting features:* Very deep soils, loamy and gravelly throughout the profile  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Foot slopes of fan piedmont remnants  
*Contrasting features:* Very stony surface layer  
*Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Buffaran soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Wieland soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Buffaran Soil for Selected Uses

*Range seeding:* Poor—droughty, rooting depth  
*Daily cover for landfill:* Poor—cemented pan, hard to pack  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan, low strength  
*Roadfill:* Poor—low strength, cemented pan  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan  
*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Wieland Soil for Selected Uses**

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Fair—small stones, slope  
*Shallow excavations:* Moderate—too clayey, slope  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—thin layer

### **Interpretive Groups**

*Capability classification:* Buffaran soil—VIIs, nonirrigated; Wieland soil—VIs, nonirrigated  
*Range site:* Buffaran soil—024X005N; Wieland soil—024X005N

## **2541—Buffaran-Zoesta association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 6,200 to 6,800 feet  
*Average annual precipitation:* About 10 inches  
*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 100 days

### **Composition**

#### **Major components:**

- Buffaran gravelly loam, 4 to 8 percent slopes, very stony—Xerollic Durargids, clayey, montmorillonitic, mesic, shallow—60 percent
- Zoesta cobbly loam, 8 to 15 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—25 percent

#### **Contrasting inclusions:**

- Inclusion 1: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—7 percent
- Inclusion 2: Xerollic Camborthids, 4 to 15 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Xerollic Haplargids, 4 to 15 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—3 percent

### **Characteristics of the Buffaran Soil**

*Position on landscape:* Summits and shoulder slopes of lower fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, downy rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 4 inches—gravelly loam; 5 to 15 percent cobbles and stones and 20 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL; estimated AASHTO classification—A-6  
 4 to 15 inches—gravelly clay loam, gravelly clay, clay; 0 to 5 percent cobbles and stones and 15 to 30 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7  
 15 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.6 to 2.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Zoesta Soil**

*Position on landscape:* Summits of higher fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, downy rabbitbrush

### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

7 to 23 inches—clay; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

23 to 31 inches—gravelly clay loam, gravelly clay; 30 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

31 to 60 inches—very gravelly clay loam, very gravelly loam; 55 to 70 percent pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 7.9 to 9.1 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly concave side slopes of fan piedmont remnants

*Contrasting features:* Slopes of 30 to 50 percent

*Distinctive present vegetation:* Big sagebrush

#### Inclusion 2

*Position on landscape:* Narrow inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### Inclusion 3

*Position on landscape:* Shoulder slopes of upper fan piedmont remnants

*Contrasting features:* Very gravelly layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, mountain big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Buffaran soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Zoesta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Buffaran Soil for Selected Uses

*Range seeding:* Poor—droughty, rooting depth

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan, low strength

*Roadfill:* Poor—low strength, cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Zoesta Soil for Selected Uses

*Range seeding:* Poor—rooting depth

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey, slope

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Fair—shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

### Interpretive Groups

*Capability classification:* Buffaran soil—VIIs, nonirrigated; Zoesta soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Buffaran soil—024X005N; Zoesta soil—024X018N

## 2550—Laped-Old Camp-Colbar association

### Map Unit Setting

*Position on landscape:* Hills

*Elevation:* 5,200 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 47 degrees F  
*Frost-free season:* About 105 days

### **Composition**

#### *Major components:*

- Laped gravelly loam, 4 to 15 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—30 percent
- Old Camp gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—30 percent
- Colbar gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—25 percent

#### *Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 8 to 15 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—8 percent
- Inclusion 2: Rock outcrop—7 percent

### **Characteristics of the Laped Soil**

*Position on landscape:* Crests and shoulder slopes of hills

*Parent material:* Kind—residuum and colluvium; source—rhyolitic rocks

*Slope features:* Length—short; shape—convex to smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Sandberg bluegrass

#### **Typical Profile**

0 to 6 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

6 to 18 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6, A-7

18 to 23 inches—indurated duripan; massive  
 23 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.3 to 2.7 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Old Camp Soil**

*Position on landscape:* South-facing side slopes of hills

*Parent material:* Kind—residuum influenced by volcanic ash; source—rhyolitic tuff

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Sandberg bluegrass, bottlebrush squirreltail

#### **Typical Profile**

0 to 2 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

2 to 14 inches—very stony clay loam, very cobbly clay loam, extremely stony sandy clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of hills

*Parent material:* Kind—residuum and colluvium;  
source—rhyolitic rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush,  
spiny hopsage, Sandberg bluegrass, bottlebrush  
squirreltail

### **Typical Profile**

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC, SM, GM; estimated AASHTO classification—A-4

3 to 22 inches—cobble loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobble loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.3 to 3.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Foot slopes of hills

*Contrasting features:* Bedrock at a depth of more than 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 2**

*Position on landscape:* Rimrock on shoulder slopes of hills and scattered small peaks

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Laped soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Laped Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock, cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stone, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Fair—droughty, large stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—slope, small stones  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Laped soil—VIIIs, nonirrigated;  
 Old Camp soil—VIIIs, nonirrigated; Colbar soil—VIIe,  
 nonirrigated  
*Range site:* Laped soil—024X002N; Old Camp soil—  
 027X007N; Colbar soil—027X007N

## **2551—Laped-Colbar-Osoll association**

### **Map Unit Setting**

*Position on landscape:* Hills  
*Elevation:* 5,00 to 6,000 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Laped gravelly loam, 8 to 15 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—35 percent
- Colbar cobbly loam, 8 to 15 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—30 percent
- Osoll gravelly loam, 2 to 8 percent slopes—Typic Durorthids, loamy-skeletal, mixed, mesic, shallow—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Xerollic Durorthids, 2 to 8 percent slopes—Xerollic Durorthids, loamy-skeletal, mixed, mesic—8 percent
- Inclusion 2: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, fine-loamy, mixed, mesic—4 percent
- Inclusion 3: Beoska very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—3 percent

### **Characteristics of the Laped Soil**

*Position on landscape:* Crests, shoulders, and south-facing side slopes of hills  
*Parent material:* Kind—residuum; source—rhyolitic tuff and andesite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass, bottlebrush squirreltail  
*Surface cover:* 30 percent pebbles

### **Typical Profile**

0 to 6 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4  
 6 to 18 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6, A-7  
 18 to 23 inches—indurated duripan; massive  
 23 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 14 to 30 inches  
*Depth to bedrock:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.3 to 2.7 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of hills  
*Parent material:* Kind—colluvium and residuum; source—rhyolitic and andesitic tuffs  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—cobbly loam; 35 to 45 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH



7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Osoll Soil

*Position on landscape:* Lower side slopes of hills  
*Parent material:* Kind—residuum and colluvium influenced by loess; source—andesite, dacite, and rhyolitic tuff  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Indian ricegrass  
*Surface cover:* 30 percent pebbles

### Typical Profile

0 to 5 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, CL-ML; estimated AASHTO classification—A-4

5 to 12 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

12 to 35 inches—indurated duripan; platy structure; extremely hard, extremely firm  
 35 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 8 to 14 inches  
*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 0.9 to 1.3 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave, north-facing foot slopes of hills  
*Contrasting features:* Duripan at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Concave inset fans  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Adjacent smooth fan piedmont remnants  
*Contrasting features:* Layer of sodium-affected clay accumulation  
*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Laped soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Osoll soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Laped Soil for Selected Uses***Range seeding:* Poor—droughty, too arid*Daily cover for landfill:* Poor—depth to bedrock, small stones*Shallow excavations:* Severe—depth to bedrock, cemented pan*Local roads and streets:* Severe—cemented pan*Roadfill:* Poor—depth to bedrock*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—cemented pan, small stones*Pond reservoir areas:* Severe—cemented pan, slope*Embankments, dikes, and levees:* Severe—thin layer**Ratings of the Colbar Soil for Selected Uses***Range seeding:* Fair—droughty, large stones*Daily cover for landfill:* Poor—depth to bedrock, large stones*Shallow excavations:* Severe—depth to bedrock*Local roads and streets:* Moderate—slope, depth to bedrock, low strength*Roadfill:* Poor—depth to bedrock*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—large stones*Pond reservoir areas:* Severe—seepage, slope*Embankments, dikes, and levees:* Moderate—large stones, piping**Ratings of the Osoll Soil for Selected Uses***Range seeding:* Poor—droughty, too arid*Daily cover for landfill:* Poor—depth to bedrock, small stones*Shallow excavations:* Severe—depth to bedrock, cemented pan*Local roads and streets:* Severe—cemented pan*Roadfill:* Poor—depth to bedrock*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—small stones, cemented pan*Pond reservoir areas:* Severe—cemented pan*Embankments, dikes, and levees:* Severe—thin layer**Interpretive Groups***Capability classification:* Laped soil—VIIIs, nonirrigated; Colbar soil—VIs, nonirrigated; Osoll soil—VIIIs, nonirrigated*Range site:* Laped soil—024X002N; Colbar soil—024X005N; Osoll soil—024X002N**2552—Laped-Old Camp-Puett association****Map Unit Setting***Position on landscape:* Hills*Elevation:* 5,000 to 6,000 feet*Average annual precipitation:* About 8 inches*Average annual air temperature:* About 48 degrees F*Frost-free season:* About 110 days**Composition***Major components:*

- Laped gravelly very fine sandy loam, 4 to 15 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—35 percent
  - Old Camp very gravelly fine sandy loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—30 percent
  - Puett fine sandy loam, 30 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—20 percent
- Contrasting inclusions:*
- Inclusion 1: Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—7 percent
  - Inclusion 2: Rock outcrop—5 percent
  - Inclusion 3: Typic Torriorthents, 8 to 30 percent slopes—Typic Torriorthents, loamy, mixed (calcareous), mesic, shallow—3 percent

**Characteristics of the Laped Soil***Position on landscape:* Crests and side slopes of hills*Parent material:* Kind—residuum and colluvium; source—rhyolitic ash flow tuffs*Slope features:* Length—long; shape—convex*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Indian ricegrass**Typical Profile**

- 0 to 6 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4, A-2
- 6 to 18 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6, A-7
- 18 to 23 inches—indurated duripan; massive
- 23 inches—unweathered bedrock

**Soil and Water Features***Depth to hardpan:* 14 to 20 inches*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.3 to 2.7 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Old Camp Soil**

*Position on landscape:* North-facing side slopes of hills  
*Parent material:* Kind—very gravelly residuum and colluvium; source—rhyolitic ash flow tuffs  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly fine sandy loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
 2 to 14 inches—very cobbly clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6  
 14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.5 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Puett Soil**

*Position on landscape:* Eroded, south-facing side slopes of hills  
*Parent material:* Kind—residuum; source—tuffaceous, weakly consolidated sediments  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail, Wyoming big sagebrush

### **Typical Profile**

0 to 4 inches—fine sandy loam; 5 to 15 pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4  
 4 to 15 inches—coarse sandy loam, sandy loam, fine sandy loam; 5 to 25 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-1, A-2, A-4  
 15 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 1.8 to 2.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Alluvial fans adjacent to hills  
*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Rimrock and eroded side slopes of hills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

**Inclusion 3**

*Position on landscape:* Convex, eroded areas on shoulders and side slopes of hills

*Contrasting features:* Soft bedrock at a depth of 10 to 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Laped soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Puett soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Laped Soil for Selected Uses**

*Range seeding:* Poor—droughty, too arid

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock, cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Puett Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—seepage, piping

**Interpretive Groups**

*Capability classification:* Laped soil—VIIIs, nonirrigated; Old Camp soil—VIIIs, nonirrigated; Puett soil—VIIIs, nonirrigated

*Range site:* Laped soil—024X002N; Old Camp soil—024X005N; Puett soil—025X025N

**2553—Laped-Stingdorn-Colbar association****Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,000 to 5,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- Laped cobbly loam, 4 to 15 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—45 percent
- Stingdorn cobbly loam, 15 to 30 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—25 percent
- Colbar very cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Orovida fine sandy loam, 4 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Rock outcrop—3 percent
- Inclusion 3: Typic Durargids, 8 to 15 percent slopes—Typic Durargids, clayey-skeletal, mixed, mesic—2 percent

**Characteristics of the Laped Soil**

*Position on landscape:* Crests of foothills

*Parent material:* Kind—residuum and colluvium;

source—andesite, dacite, and rhyolitic ash flow tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

**Typical Profile**

0 to 6 inches—cobbly loam; 15 to 25 percent cobbles and stones and 10 to 25 percent pebbles (by

weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

6 to 18 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6, A-7

18 to 23 inches—indurated duripan; massive

23 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.3 to 2.7 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Stingdorn Soil**

*Position on landscape:* South-facing side slopes of foothills

*Parent material:* Kind—residuum; source—tuff

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, spiny hopsage, small rabbitbrush

### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10);

estimated Unified classification—GC; estimated AASHTO classification—A-6

15 to 20 inches—indurated duripan; massive

20 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 20 inches

*Depth to bedrock:* 8 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.5 to 1.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—colluvium and residuum; source—tuff

*Slope features:* Length—short; shape—slightly convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, small rabbitbrush, Webber ricegrass

### **Typical Profile**

0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR

less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave inset fans  
*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Scattered peaks of foothills  
*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### Inclusion 3

*Position on landscape:* Concave foot slopes of foothills  
*Contrasting features:* Indurated duripan at a depth of 20 to 30 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Laped soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Laped Soil for Selected Uses

*Range seeding:* Poor—droughty, too arid  
*Daily cover for landfill:* Poor—depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Stingdorn Soil for Selected Uses

*Range seeding:* Poor—droughty, too arid

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, large stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones

#### Ratings of the Colbar Soil for Selected Uses

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

### Interpretive Groups

*Capability classification:* Laped soil—VIIIs, nonirrigated; Stingdorn soil—VIIIs, nonirrigated; Colbar soil—VIIIs, nonirrigated

*Range site:* Laped soil—024X002N; Stingdorn soil—024X002N; Colbar soil—024X005N

## 2555—Laped-Colbar association

### Map Unit Setting

*Position on landscape:* Hills

*Elevation:* 5,200 to 6,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 100 days

### Composition

#### Major components:

- Laped very cobbly loam, 15 to 30 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—55 percent
- Colbar very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—30 percent

#### Contrasting inclusions:

- Inclusion 1: Typic Haplargids, 2 to 8 percent slopes—Typic Haplargids, fine, montmorillonitic, mesic—8 percent
- Inclusion 2: Typic Durargids, 30 to 50 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Xeric Torriorthents, 30 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—2 percent

### Characteristics of the Laped Soil

*Position on landscape:* Crests, shoulders, and south-facing side slopes of hills

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, horsebrush, pine bluegrass, Indian ricegrass

#### Typical Profile

0 to 6 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

6 to 8 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6, A-7

18 to 23 inches—indurated duripan; massive

23 inches—unweathered bedrock

#### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.1 to 2.5 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Characteristics of the Colbar Soil

*Position on landscape:* North-facing side slopes of hills

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass

#### Typical Profile

0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.3 to 3.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Interhill fans  
*Contrasting features:* Deep soils that have a clayey subsoil  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Convex, lower, south-facing side slopes of hills  
*Contrasting features:* Indurated duripan at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Shadscale, Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Concave, eroded side slopes of hills  
*Contrasting features:* Bedrock within a depth of 20 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Laped soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Laped Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones, too arid  
*Daily cover for landfill:* Poor—depth to bedrock, small stones  
*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope  
*Local roads and streets:* Severe—cemented pan, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—cemented pan, small stones, slope  
*Pond reservoir areas:* Severe—cemented pan, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—slope, large stones  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Laped soil—VIIIs, nonirrigated; Colbar soil—VIIIs, nonirrigated  
*Range site:* Laped soil—024X002N; Colbar soil—024X005N

## **2561—Puett-Genaw-Orovada association**

### **Map Unit Setting**

*Position on landscape:* Hills  
*Elevation:* 5,600 to 5,800 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Puett very gravelly loam, 15 to 30 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—50 percent
  - Genaw gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, loamy, mixed, mesic, shallow—20 percent
  - Orovada fine sandy loam, 2 to 8 percent slopes, rarely flooded—Durixerollic Camborthids, coarse-loamy, mixed, mesic—15 percent
- Contrasting inclusions:*
- Inclusion 1: Lithic Xerollic Haplargids, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—8 percent
  - Inclusion 2: Typic Camborthids, 4 to 30 percent slopes—Typic Camborthids, loamy, mixed, mesic, shallow—5 percent
  - Inclusion 3: Rock outcrop—2 percent

### **Characteristics of the Puett Soil**

*Position on landscape:* Eroded side slopes of hills  
*Parent material:* Kind—residuum; source—tuffaceous, weakly consolidated sediments  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Small rabbitbrush, bottlebrush squirreltail, shadscale, black sagebrush, spiny hopsage



### Typical Profile

- 0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1
- 4 to 15 inches—coarse sandy loam, gravelly sandy loam, loam; 10 to 50 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML, GM; estimated AASHTO classification—A-1, A-2, A-4
- 15 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 1.6 to 2.0 inches  
*Water-supplying capacity:* 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Genaw Soil

*Position on landscape:* Summits and stable side slopes of hills  
*Parent material:* Kind—loess mantled residuum; source—tuffaceous, weakly consolidated sediments  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, spiny hopsage

### Typical Profile

- 0 to 6 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4
- 6 to 11 inches—gravelly loam, gravelly clay loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure;

- slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6
- 11 to 16 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
- 16 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 1.9 to 2.4 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Orovada Soil

*Position on landscape:* Inset fans  
*Parent material:* Loess capped mixed alluvium  
*Slope features:* Length—short; shape—smooth to concave  
*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, Sandberg bluegrass, littleleaf horsebrush

### Typical Profile

- 0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
- 8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
- 20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight);

massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* 8.4 to 9.6 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly convex side slopes of hills  
*Contrasting features:* Hard bedrock at a depth of 10 to 20 inches  
*Distinctive present vegetation:* Black sagebrush, small rabbitbrush

#### Inclusion 2

*Position on landscape:* Slightly concave parts of crests and side slopes of hills  
*Contrasting features:* Soft bedrock at a depth of 14 to 20 inches, lacks layer of clay accumulation  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Eroded side slopes of hills  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Puett soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Genaw soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Orovida soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Puett Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—seepage, piping

### Ratings of the Genaw Soil for Selected Uses

*Range seeding:* Poor—droughty  
*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Orovida Soil for Selected Uses

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—frost action, flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—small stones, thin layer  
*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* Puett soil—VIIIs, nonirrigated; Genaw soil—VIIe, nonirrigated; Orovida soil—IIIe, irrigated, and VIc, nonirrigated  
*Range site:* Puett soil—025X025N; Genaw soil—028B010N; Orovida soil—028B010N

## 2571—Colbar, steep-Burrita-Colbar association

### Map Unit Setting

*Position on landscape:* Hills  
*Elevation:* 5,500 to 6,200 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 105 days

### Composition

#### Major components:

- Colbar very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—40 percent
- Burrita very cobbly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—25 percent
- Colbar gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—20 percent

#### Contrasting inclusions:

- Inclusion 1: Lithic Haplargids, 15 to 30 percent slopes—Lithic Haplargids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 2: Xerollic Camborthids, 4 to 15 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Rock outcrop—3 percent
- Inclusion 4: Lithic Xerollic Haplargids, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—2 percent

### Characteristics of the Colbar, Steep, Soil

*Position on landscape:* South-facing side slopes of hills

*Parent material:* Kind—residuum and colluvium; source—tuff

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, pine bluegrass

### Typical Profile

- 0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
- 26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.3 to 3.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Burrita Soil

*Position on landscape:* Summits and shoulder slopes of hills

*Parent material:* Kind—residuum; source—metamorphic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, pine bluegrass

### Typical Profile

- 0 to 3 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4
- 3 to 18 inches—very cobbly clay, very stony clay loam, very gravelly clay loam; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7
- 18 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.6 to 2.1 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of hills

*Parent material:* Kind—colluvium over residuum;  
source—tuff

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush,  
bottlebrush squirreltail, pine bluegrass

### **Typical Profile**

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, GM-GC, GM; estimated AASHTO classification—A-4

3 to 22 inches—cobble loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobble loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.4 to 3.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, south-facing, lower side slopes of hills

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* Concave inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, basin wildrye

#### **Inclusion 3**

*Position on landscape:* Scattered peaks of hills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 4**

*Position on landscape:* Convex parts of summits of hills

*Contrasting features:* Bedrock at a depth of 10 to 20 inches, slopes of 15 to 30 percent

*Distinctive present vegetation:* Black sagebrush, pine bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Colbar steep soil for named elements:*

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Burrita soil for named elements:* Wild

herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild

herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Colbar, Steep, Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Burrita Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Fair—droughty, too arid

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, small stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Colbar, steep, soil—VIIs, nonirrigated; Burrita soil—VIIs, nonirrigated; Colbar soil—VIe, nonirrigated

*Range site:* Colbar, steep, soil—024X005N; Burrita soil—024X005N; Colbar soil—024X005N

### **2573—Colbar-Midraw association**

#### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Colbar cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—65 percent
- Midraw very cobbly loam, 15 to 30 percent slopes—Xerollic Durargids, clayey, montmorillonitic, mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Durargids, 4 to 15 percent slopes—Xerollic Durargids, fine, montmorillonitic, mesic—10 percent
- Inclusion 2: Xerollic Durorthids, 2 to 8 percent

slopes—Xerollic Durorthids, loamy-skeletal, mixed, mesic—3 percent

- Inclusion 3: Rock outcrop—2 percent

#### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—colluvium over residuum; source—tuff

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail, pine bluegrass

#### **Typical Profile**

0 to 3 inches—cobbly loam; 35 to 45 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.4 to 3.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Midraw Soil**

*Position on landscape:* Predominantly south-facing side slopes of hills

*Parent material:* Kind—colluvium over residuum influenced by loess and volcanic ash; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, littleleaf horsebrush, bottlebrush squirreltail, pine bluegrass

*Surface cover:* 10 percent pebbles, 30 percent cobbles, 10 percent stones

### **Typical Profile**

0 to 6 inches—very cobbly loam; 30 to 40 percent cobbles and stones and 30 to 60 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-2

6 to 16 inches—gravelly clay, gravelly clay loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-7

16 to 31 inches—indurated duripan

31 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 22 to 35 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, north-facing crests and shoulder slopes of foothills

*Contrasting features:* Duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 2**

*Position on landscape:* Inset fans

*Contrasting features:* Duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

#### **Inclusion 3**

*Position on landscape:* Rimrock on side slopes of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Midraw soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Fair—droughty, too arid

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Midraw Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—cemented pan, slope, depth to bedrock

*Local roads and streets:* Severe—cemented pan, slope, shrink-swell

*Roadfill:* Poor—depth to bedrock, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones, slope

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Colbar soil—Vle, nonirrigated;  
Midraw soil—VIIs, nonirrigated  
*Range site:* Colbar soil—024X005N; Midraw soil—  
024X028N

## **2575—Colbar-Perwick-Settlemeier association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 5,400 to 6,000 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Colbar gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—40 percent
- Perwick very gravelly loam, 30 to 50 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—30 percent
- Settlemeier loam, drained, 2 to 4 percent slopes—Fluvaquentic Haplaquolls, fine-loamy, mixed, mesic—15 percent

#### *Contrasting inclusions:*

- Inclusion 1: Lithic Xerollic Camborthids, 15 to 30 percent slopes—Lithic Xerollic Camborthids, loamy-skeletal, mixed, mesic—8 percent
- Inclusion 2: Xerollic Haplargids, 2 to 8 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—5 percent
- Inclusion 3: Rock outcrop—2 percent

### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—tuffs  
*Slope features:* Length—long; shape—convex to slightly concave  
*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, small rabbitbrush, singleleaf pinyon, Utah juniper

### **Typical Profile**

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—SM-SC, SM, GM-GC, GM; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Perwick Soil**

*Position on landscape:* South-facing side slopes of mountains  
*Parent material:* Kind—residuum; source—interbedded tuffaceous sediments  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, mountain big sagebrush, pine bluegrass, bluebunch wheatgrass, bottlebrush squirreltail  
*Surface cover:* 20 percent pebbles, 15 percent cobbles

### **Typical Profile**

0 to 6 inches—very gravelly loam; 50 to 60 percent pebbles (by weight); granular structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2  
6 to 27 inches—gravelly sandy loam, gravelly loam, gravelly silt loam; 25 to 50 percent pebbles (by

weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

27 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Settlemyer Soil**

*Position on landscape:* Inset fans along canyon bottoms of mountains

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye

### **Typical Profile**

0 to 16 inches—loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

16 to 40 inches—silt loam, silty clay loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

40 to 60 inches or more—fine sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* December through March—36 to 48 inches; rest of year—below 48 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 9.4 to 11.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, dissected toe slopes of mountains

*Contrasting features:* Bedrock at a depth of 10 to 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

#### **Inclusion 2**

*Position on landscape:* Alluvial fans

*Contrasting features:* Deep soils, layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

#### **Inclusion 3**

*Position on landscape:* Escarpments and canyon walls of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Perwick soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Settlemyer soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Fair—droughty, too arid

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock



*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—slope, small stones  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Perwick Soil for Selected Uses**

*Range seeding:* Poor—small stones  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Settlemyer Soil for Selected Uses**

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Fair—too clayey, wetness  
*Shallow excavations:* Moderate—wetness  
*Local roads and streets:* Severe—frost action, low strength  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—small stones  
*Pond reservoir areas:* Moderate—slope  
*Embankments, dikes, and levees:* Moderate—wetness

#### **Interpretive Groups**

*Capability classification:* Colbar soil—VIe, nonirrigated;  
 Perwick soil—VIIs, nonirrigated; Settlemyer soil—  
 IIw, irrigated, and VIw, nonirrigated  
*Range site:* Colbar soil—024X005N; Perwick soil—  
 025X035N; Settlemyer soil—025X003N

### **2591—Osoll Variant-Oxcotel association**

#### **Map Unit Setting**

*Position on landscape:* Hills and fan piedmonts  
*Elevation:* 5,000 to 6,000 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

#### **Composition**

##### *Major components:*

- Osoll Variant gravelly loam, 4 to 15 percent slopes—Typic Durorthids, loamy-skeletal, mixed, mesic—60 percent
- Oxcotel gravelly loam, 4 to 15 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—25 percent

##### *Contrasting inclusions:*

- Inclusion 1: Rubble land—5 percent
- Inclusion 2: Lithic Xerollic Haplargids, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent
- Inclusion 3: Typic Camborthids, 4 to 8 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—3 percent
- Inclusion 4: Rock outcrop—2 percent

#### **Characteristics of the Osoll Variant Soil**

*Position on landscape:* Side slopes of hills  
*Parent material:* Kind—colluvium; source—tuff  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail  
*Surface cover:* 25 percent pebbles

#### **Typical Profile**

- 0 to 10 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2, A-4
- 10 to 26 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
- 26 to 60 inches or more—indurated duripan

#### **Soil and Water Features**

*Depth to hardpan:* 20 to 35 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.6 to 3.4 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

#### **Characteristics of the Oxcotel Soil**

*Position on landscape:* Piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 5 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4

5 to 36 inches—clay, clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 40); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

36 to 60 inches or more—very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 36 inches—very slow; below this depth—moderately rapid

*Available water capacity:* 5.4 to 8.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Rock stringers on side slopes of hills

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Concave, north-facing foot slopes of hills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass

#### Inclusion 3

*Position on landscape:* Convex toe slopes of hills

*Contrasting features:* Deep soils, sandy loam and loam throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 4

*Position on landscape:* Scattered rimrock areas of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Osoll Variant soil for named elements:*

Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Oxcorel soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Osoll Variant Soil for Selected Uses

*Range seeding:* Poor—too arid

*Daily cover for landfill:* Poor—cemented pan, small stones

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Moderate—cemented pan, slope

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Oxcorel Soil for Selected Uses

*Range seeding:* Poor—too arid, rooting depth, excess sodium

*Daily cover for landfill:* Poor—small stones, excess sodium

*Shallow excavations:* Moderate—too clayey, slope

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess sodium, area reclaim

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### **Interpretive Groups**

*Capability classification:* Osoll Variant soil—VIIIs, nonirrigated; Oxcorel soil—VIIIs, nonirrigated

*Range site:* Osoll Variant soil—024X002N; Oxcorel soil—024X002N

## **2600—Grina-Caniwe-Handy association**

### **Map Unit Setting**

*Position on landscape:* Hills and interhill fans

*Elevation:* 6,000 to 6,500 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Grina gravelly loam, 15 to 30 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—45 percent
  - Caniwe silt loam, 2 to 4 percent slopes—Aridic Duric Haploxerolls, fine-silty, mixed, mesic—20 percent
  - Handy loam, 4 to 8 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—20 percent
- Contrasting inclusions:*

- Inclusion 1: Aridic Argixerolls, 8 to 30 percent slopes—Aridic Argixerolls, loamy, mixed, mesic, shallow—6 percent
- Inclusion 2: Typic Camborthids, 30 to 50 percent slopes, eroded—Typic Camborthids, loamy, mixed, mesic, shallow—6 percent
- Inclusion 3: Cumulic Haploxerolls, 0 to 4 percent slopes—Cumulic Haploxerolls, fine-loamy, mixed, mesic—3 percent

### **Characteristics of the Grina Soil**

*Position on landscape:* Side slopes of rolling hills

*Parent material:* Kind—residuum; source—soft sedimentary rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush

### **Typical Profile**

0 to 5 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SC; estimated AASHTO classification—A-4, A-6

5 to 14 inches—loam, silty clay loam, silt loam; 0 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

14 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.8 to 2.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Caniwe Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium and loess

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, arrowleaf balsamroot, pine bluegrass

### **Typical Profile**

0 to 17 inches—silt loam; platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

17 to 60 inches or more—stratified silty clay loam to silt loam; subangular blocky structure; hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Handy Soil**

*Position on landscape:* Interhill fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, arrowleaf balsamroot, pine bluegrass

### **Typical Profile**

0 to 4 inches—loam; 0 to 5 percent cobbles and stones and 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, CL, ML; estimated AASHTO classification—A-4, A-6

4 to 30 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 0 to 40 percent pebbles (by weight); prismatic structure; extremely hard, very firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

30 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 0 to 5 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 30 inches—slow; below this depth—moderately rapid

*Available water capacity:* 5.9 to 7.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests and concave side slopes of hills

*Contrasting features:* Layer of clay accumulation

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper

#### **Inclusion 2**

*Position on landscape:* Steep, eroded side slopes of hills

*Contrasting features:* Slopes of 30 to 50 percent

*Distinctive present vegetation:* Utah juniper, Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Concave areas adjacent to stream channels

*Contrasting features:* Very deep soils that receive additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye, rubber rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Woodland on the Grina soil:**

*Site index for common trees:* Singleleaf pinyon—30; Utah juniper—30

*Most important native understory plants:* Indian ricegrass, Thurber needlegrass, bluebunch wheatgrass, bluegrass, big sagebrush, tapertip hawksbeard

#### **Wildlife habitat elements:**

*Suitability of the Grina soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

*Suitability of the Caniwe soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Handy soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Grina Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, slope

*Roadfill:* Poor—depth to bedrock, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, depth to bedrock

*Pond reservoir areas:* Severe—slope, depth to bedrock

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Caniwe Soil for Selected Uses**

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Fair—too clayey  
*Shallow excavations:* Slight  
*Local roads and streets:* Severe—low strength  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—too clayey  
*Pond reservoir areas:* Moderate—slope  
*Embankments, dikes, and levees:* Severe—piping

**Ratings of the Handy Soil for Selected Uses**

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Grina soil—Vlle, nonirrigated;  
 Caniwe soil—Ile, irrigated, and Vle, nonirrigated;  
 Handy soil—Vlls, nonirrigated  
*Range site:* Grina soil—025X059N; Caniwe soil—  
 025X014N; Handy soil—025X014N  
*Woodland suitability group:* Grina soil—1D

**2602—Grina-Grina, eroded-Caniwe association****Map Unit Setting**

*Position on landscape:* Hills and mountain valley fans  
*Elevation:* 5,800 to 6,200 feet  
*Average annual precipitation:* About 11 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 105 days

**Composition****Major components:**

- Grina gravelly loam, 15 to 30 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—50 percent
- Grina very gravelly loam, 15 to 30 percent slopes, eroded—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—20 percent
- Caniwe silt loam, 2 to 4 percent slopes—Aridic Duric Haploxerolls, fine-silty, mixed, mesic—15 percent

**Contrasting inclusions:**

- Inclusion 1: Typic Camborthids, 30 to 50 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic, shallow—5 percent
- Inclusion 2: Typic Torriorthents, 15 to 30 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic, shallow—5 percent
- Inclusion 3: Xerollic Haplargids, 4 to 8 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—5 percent

**Characteristics of the Grina Soil**

*Position on landscape:* Summits and north-, east-, and west-facing side slopes of rolling hills  
*Parent material:* Kind—loamy residuum; source—tuffaceous, weakly consolidated sediments  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, big sagebrush, bluegrass  
*Surface cover:* 40 percent pebbles

**Typical Profile**

0 to 5 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SC; estimated AASHTO classification—A-4, A-6  
 5 to 15 inches—loam, silty clay loam, silt loam; 0 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
 15 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.8 to 2.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

**Characteristics of the Grina, Eroded, Soil**

*Position on landscape:* South-facing side slopes of hills

*Parent material:* Kind—loamy residuum; source—tuffaceous, weakly consolidated sediments

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, big sagebrush

**Typical Profile**

0 to 3 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

3 to 14 inches—loam, silty clay loam, silt loam; 0 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

14 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.7 to 2.5 inches

*Water-supplying capacity:* 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

**Characteristics of the Caniwe Soil**

*Position on landscape:* Inset fans on interhill remnants

*Parent material:* Mixed alluvium and loess

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Mountain big sagebrush, bluegrass, rubber rabbitbrush

**Typical Profile**

0 to 17 inches—silt loam; platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

17 to 60 inches or more—stratified silty clay loam to silt loam; subangular blocky structure; hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-7

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Eroded side slopes of hills

*Contrasting features:* Slopes of 30 to 50 percent

*Distinctive present vegetation:* Utah juniper, mountain big sagebrush

**Inclusion 2**

*Position on landscape:* South-facing, lower side slopes of hills

*Contrasting features:* Soft bedrock at a depth of 4 to 10 inches

*Distinctive present vegetation:* Utah juniper, mountain big sagebrush

**Inclusion 3**

*Position on landscape:* Slightly convex interhill fan remnants

*Contrasting features:* Deep soils that have a layer of clay accumulation

*Distinctive present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, pine bluegrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Woodland on the Grina soil:**

*Site index for common trees:* Singleleaf pinyon—30; Utah juniper—30

*Most important native understory plants:* Indian ricegrass, Thurber needlegrass, basin wildrye, bluebunch wheatgrass, big sagebrush, tapertip hawksbeard, bluegrass

**Woodland on the Grina, eroded, soil:**

*Site index for common trees:* Singleleaf pinyon—18;  
Utah juniper—18

*Most important native understory plants:* Indian ricegrass, Thurber needlegrass, basin wildrye, bluebunch wheatgrass, big sagebrush, tapertip hawksbeard, bluegrass

**Wildlife habitat elements:**

*Suitability of the Grina soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

*Suitability of the Grina, eroded, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

*Suitability of the Caniwe soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Grina Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, slope

*Roadfill:* Poor—depth to bedrock, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, depth to bedrock

*Pond reservoir areas:* Severe—slope, depth to bedrock

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Grina, Eroded, Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, slope

*Roadfill:* Poor—depth to bedrock, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, depth to bedrock

*Pond reservoir areas:* Severe—slope, depth to bedrock

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Caniwe Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Fair—too clayey

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—too clayey

*Pond reservoir areas:* Moderate—slope

*Embankments, dikes, and levees:* Severe—piping

**Interpretive Groups**

*Capability classification:* Grina soil—VIIe, nonirrigated; Grina, eroded, soil—VIIc, nonirrigated; Caniwe soil—IIe, irrigated, and VIc, nonirrigated

*Range site:* Grina soil—025X059N; Grina, eroded, soil—025X059N; Caniwe soil—025X014N

*Woodland suitability group:* Grina soil—1D; Grina, eroded, soil—1D

**2620—Handy-Caniwe-Zoesta association****Map Unit Setting**

*Position on landscape:* Mountain valley fans

*Elevation:* 6,000 to 6,400 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 100 days

**Composition**

*Major components:*

- Handy loam, 4 to 8 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—45 percent
  - Caniwe silt loam, 2 to 8 percent slopes—Aridic Duric Haploxerolls, fine-silty, mixed, mesic—25 percent
  - Zoesta loam, 4 to 8 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—15 percent
- Contrasting inclusions:*
- Inclusion 1: Cumulic Haploxerolls, 2 to 4 percent slopes—Cumulic Haploxerolls, fine-loamy, mixed, frigid—8 percent
  - Inclusion 2: Zoesta very gravelly fine sandy loam, 8 to 15 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—5 percent
  - Inclusion 3: Xeric Torriorthents, 8 to 15 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), frigid, shallow—2 percent

**Characteristics of the Handy Soil**

*Position on landscape:* Lower summits and side slopes of mountain valley fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, mountain big sagebrush, bluebunch wheatgrass, bluegrass, singleleaf pinyon, Utah juniper

*Surface cover:* 20 percent pebbles

**Typical Profile**

0 to 9 inches—loam; 0 to 5 percent cobbles and stones and 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm);

nonsodic (SAR less than 2); estimated Unified classification—CL-ML, CL, ML; estimated AASHTO classification—A-4, A-6

9 to 38 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 0 to 40 percent pebbles (by weight); prismatic structure; extremely hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

38 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 0 to 10 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 30 inches—slow; below this depth—moderately rapid

*Available water capacity:* 5.9 to 7.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Caniwe Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium and loess

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, rabbitbrush, bluebunch wheatgrass, bluegrass

### **Typical Profile**

0 to 17 inches—silt loam; platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

17 to 60 inches or more—stratified silty clay loam to silt loam; subangular blocky structure; hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4, A-7, A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Zoesta Soil**

*Position on landscape:* Summits of higher elevation, mountain valley fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Low sagebrush, downy rabbitbrush, bluegrass

### **Typical Profile**

0 to 7 inches—loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

7 to 23 inches—clay, clay loam; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

23 to 31 inches—gravelly clay loam, gravelly clay; 30 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

31 to 60 inches—very gravelly clay loam, very gravelly loam; 55 to 70 percent pebbles (by weight); massive; very hard, very firm; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches



*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 7.9 to 9.1 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Narrow inset fans adjacent to mountain front  
*Contrasting features:* Thick, dark colored surface layer  
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### **Inclusion 2**

*Position on landscape:* North-facing side slopes of mountain valley fan remnants  
*Contrasting features:* Slopes of 8 to 15 percent  
*Distinctive present vegetation:* Low sagebrush

#### **Inclusion 3**

*Position on landscape:* Eroded summits and side slopes of adjacent hills  
*Contrasting features:* Soft bedrock within a depth of 14 inches  
*Distinctive present vegetation:* Utah juniper, singleleaf pinyon

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Handy soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Caniwe soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Zoesta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Handy Soil for Selected Uses**

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Caniwe Soil for Selected Uses**

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Fair—too clayey  
*Shallow excavations:* Slight  
*Local roads and streets:* Severe—low strength  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—too clayey  
*Pond reservoir areas:* Moderate—slope  
*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Zoesta Soil for Selected Uses**

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—too clayey  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Fair—shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Moderate—slope  
*Embankments, dikes, and levees:* Slight

### **Interpretive Groups**

*Capability classification:* Handy soil—VIIIs, nonirrigated; Caniwe soil—Ile, irrigated, and VIc, nonirrigated; Zoesta soil—IVs, irrigated, and VIIs, nonirrigated  
*Range site:* Handy soil—025X014N; Caniwe soil—025X014N; Zoesta soil—024X018N

## **2621—Handy, gravelly-Handy-Zoesta association**

### **Map Unit Setting**

*Position on landscape:* Ballenas  
*Elevation:* 6,200 to 7,200 feet  
*Average annual precipitation:* About 11 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 100 days

### **Composition**

#### **Major components:**

- Handy gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—50 percent
- Handy loam, 8 to 15 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—20 percent

- Zoesta cobbly loam, 15 to 30 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—15 percent
- Contrasting inclusions:*

- Inclusion 1: Xerollic Durargids, 30 to 50 percent slopes—Xerollic Durargids, loamy-skeletal, mixed, frigid, shallow—7 percent
- Inclusion 2: Aridic Argixerolls, 15 to 30 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—4 percent
- Inclusion 3: Cumulic Haploxerolls, 4 to 15 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent
- Inclusion 4: Xerollic Durargids, 15 to 30 percent slopes—Xerollic Durargids, loamy-skeletal, mixed, frigid—2 percent

### **Characteristics of the Handy, Gravelly, Soil**

*Position on landscape:* South-facing side slopes of ballenas

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, bluegrass, Utah juniper

### **Typical Profile**

- 0 to 4 inches—gravelly loam; 0 to 10 percent cobbles and stones and 45 to 55 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6, A-2
- 4 to 30 inches—gravelly clay, clay; 0 to 10 percent cobbles and stones and 0 to 40 percent pebbles (by weight); prismatic structure; extremely hard, very firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
- 30 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 0 to 10 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 30 inches—slow; below this depth—moderately rapid

*Available water capacity:* 5.9 to 7.6 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Handy Soil**

*Position on landscape:* Crests and shoulder slopes of ballenas

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, pine bluegrass, Idaho fescue, Utah juniper

### **Typical Profile**

- 0 to 4 inches—loam; 0 to 5 percent cobbles and stones and 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, CL, ML; estimated AASHTO classification—A-4, A-6
- 4 to 30 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 0 to 40 percent pebbles (by weight); prismatic structure; extremely hard, very firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
- 30 to 60 inches or more—stratified gravelly loam to very gravelly loamy sand; 0 to 5 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 30 inches—slow; below this depth—moderately rapid

*Available water capacity:* 5.9 to 7.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Zoesta Soil**

*Position on landscape:* North-facing side slopes of ballenas  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Low sagebrush, bluegrass, Utah juniper

### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4  
 7 to 23 inches—clay; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7  
 23 to 31 inches—gravelly clay loam, gravelly clay; 30 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7  
 31 to 60 inches—very gravelly clay loam, very gravelly loam; 55 to 70 percent pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 7.9 to 9.1 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing, eroded side slopes of ballenas  
*Contrasting features:* Duripan at a depth of 10 to 20 inches  
*Distinctive present vegetation:* Utah juniper, singleleaf pinyon

#### **Inclusion 2**

*Position on landscape:* Lower, north-facing side slopes of ballenas  
*Contrasting features:* Dark colored surface layer  
*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue

#### **Inclusion 3**

*Position on landscape:* Inset fans dissecting ballenas  
*Contrasting features:* Receives additional soil moisture from runoff  
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### **Inclusion 4**

*Position on landscape:* Lower, south-facing side slopes of ballenas  
*Contrasting features:* Duripan within a depth of 20 inches  
*Distinctive present vegetation:* Big sagebrush, Indian ricegrass, galleta

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Handy, gravelly, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Handy soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Zoesta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Handy, Gravelly, Soil for Selected Uses**

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—low strength, shrink-swell, slope  
*Roadfill:* Fair—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Handy Soil for Selected Uses**

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Zoesta Soil for Selected Uses**

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Moderate—slope  
*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Fair—shrink-swell, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

#### **Interpretive Groups**

*Capability classification:* Handy, gravelly, soil—VIIe, nonirrigated; Handy soil—VIIs, nonirrigated; Zoesta soil—VIIs, nonirrigated

*Range site:* Handy, gravelly, soil—025X014N; Handy soil—025X014N; Zoesta soil—024X018N

### **2631—Midraw-Minat-Pineval association**

#### **Map Unit Setting**

*Position on landscape:* Mountains and mountain valley fans

*Elevation:* 5,600 to 6,200 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Midraw very gravelly loam, 30 to 50 percent slopes—Xerollic Durargids, clayey, montmorillonitic, mesic, shallow—40 percent
- Minat gravelly loam, 30 to 50 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—30 percent
- Pineval gravelly fine sandy loam, 8 to 15 percent

slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Xeric Torriorthents, 15 to 30 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—10 percent
- Inclusion 2: Lithic Xerollic Haplargids, 8 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—3 percent
- Inclusion 3: Cumulic Haploxerolls, 8 to 15 percent slopes—Cumulic Haploxerolls, fine-loamy, mixed, mesic—2 percent

#### **Characteristics of the Midraw Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Residuum and colluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bluegrass

#### **Typical Profile**

0 to 2 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

2 to 19 inches—gravelly clay loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-7

19 to 25 inches—indurated duripan

25 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 22 to 35 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.1 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Minat Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Colluvium influenced by volcanic ash

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, mountain big sagebrush, Douglas rabbitbrush, Thurber needlegrass, bluegrass

### **Typical Profile**

- 0 to 9 inches—gravelly loam; 5 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6
- 9 to 27 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2
- 27 to 60 inches or more—very gravelly fine sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 5.8 to 7.0 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Pineval Soil**

*Position on landscape:* Mountain valley fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, spiny hopsage, Thurber needlegrass

### **Typical Profile**

- 0 to 5 inches—gravelly fine sandy loam; 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2
- 5 to 11 inches—very gravelly clay loam, very gravelly sandy clay loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 11 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly sand; 0 to 25 percent cobbles and stones and 50 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.0 to 4.2 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, eroded crests and shoulders of mountains

*Contrasting features:* Very shallow

*Distinctive present vegetation:* Wyoming big sagebrush, desert needlegrass, galleta

#### **Inclusion 2**

*Position on landscape:* Convex crests of mountains

*Contrasting features:* Very gravelly texture throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush

### **Inclusion 3**

*Position on landscape:* Concave drainageways of mountains and mountain valley fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Midraw soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Minat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Pineval soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Midraw Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—cemented pan, slope, depth to bedrock

*Local roads and streets:* Severe—cemented pan, slope, shrink-swell

*Roadfill:* Poor—depth to bedrock, shrink-swell, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones, too clayey

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Minat Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

### **Ratings of the Pineval Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action, slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—area reclaim, small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Midraw soil—VIIs, nonirrigated;

Minat soil—VIIe, nonirrigated; Pineval soil—IVe, irrigated, and VIIs, nonirrigated

*Range site:* Midraw soil—024X028N; Minat soil—024X005N; Pineval soil—024X005N

## **2640—Rasille-Kelk association**

### **Map Unit Setting**

*Position on landscape:* Inset fans

*Elevation:* 5,000 to 5,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Rasille silt loam, gravelly substratum, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-silty, mixed, mesic—45 percent

- Kelk silt loam, 0 to 2 percent slopes, occasionally flooded—Durixerollic Camborthids, fine-silty, mixed, mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Torriorthents, 0 to 2 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—8 percent

- Inclusion 2: Duric Camborthids, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—4 percent

- Inclusion 3: Aerice Halaquepts, 0 to 2 percent slopes—Aerice Halaquepts, fine-silty, mixed (calcareous), mesic—3 percent

### **Characteristics of the Rasille Soil**

*Position on landscape:* Lower inset fans adjacent to the margins of fan skirts and alluvial flats

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 6 inches—silt loam; platy structure; slightly hard,

very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 15 inches—very fine sandy loam, silt loam; prismatic structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 to 41 inches—very fine sandy loam, silt loam; massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

41 to 60 inches or more—stratified fine sandy loam to very gravelly coarse sand; 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13) estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 7.8 to 9.7 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Kelk Soil

*Position on landscape:* Adjacent to channeled and overwash parts of upper inset fans

*Parent material:* Silty mixed alluvium and loess

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye, black greasewood

### Typical Profile

0 to 14 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

14 to 51 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

51 to 60 inches or more—silt loam; 0 to 10 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—brief to long; months—February through June

*Permeability:* In the upper 42 inches—slow; below this depth—moderate

*Available water capacity:* 11.3 to 12.5 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Adjacent alluvial flat remnants

*Contrasting features:* Calcareous throughout the profile

*Distinctive present vegetation:* Shadscale, black greasewood

#### Inclusion 2

*Position on landscape:* Adjacent remnants of fan skirts

*Contrasting features:* Loamy throughout the profile

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Adjacent alluvial flats

*Contrasting features:* Seasonal water table within a depth of 40 inches

*Distinctive present vegetation:* Black greasewood, rubber rabbitbrush, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Rasille soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Kelk soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Rasille Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Fair—thin layer

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—area reclaim

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Kelk Soil for Selected Uses**

*Range seeding:* Fair—too arid, excess salt

*Daily cover for landfill:* Good

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—low strength, flooding

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

#### **Interpretive Groups**

*Capability classification:* Rasille soil—IIIc, irrigated, and VIc, nonirrigated; Kelk soil—IIw, irrigated, and VIw, nonirrigated

*Range site:* Rasille soil—028B010N; Kelk soil—024X006N

### **2652—Malpais-Stingdorn association**

#### **Map Unit Setting**

*Position on landscape:* Hills

*Elevation:* 5,400 to 6,200 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Malpais very gravelly fine sandy loam, 15 to 50 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—50 percent
- Stingdorn extremely cobbly loam, 4 to 15 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—40 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Durargids, 30 to 50 percent

slopes—Xerollic Durargids, clayey-skeletal, montmorillonitic, mesic—5 percent

- Inclusion 2: Lithic Camborthids, 15 to 30 percent slopes—Lithic Camborthids, loamy-skeletal, mixed, mesic—3 percent

- Inclusion 3: Rock outcrop—2 percent

#### **Characteristics of the Malpais Soil**

*Position on landscape:* Lower side slopes of hills

*Parent material:* Kind—colluvium influenced by loess and volcanic ash; source—rhyolite and andesite

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Bud sagebrush, shadscale, Indian ricegrass

#### **Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1

3 to 15 inches—very gravelly loam, very cobbly fine sandy loam; 5 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

15 to 60 inches or more—extremely cobbly loam, extremely cobbly sandy loam, very cobbly loam; 40 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.6 to 5.4 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low



### **Characteristics of the Stingdorn Soil**

*Position on landscape:* Crests and upper side slopes of hills

*Parent material:* Kind—residuum; source—andesite and rhyolite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Bud sagebrush, shadscale, Indian ricegrass

### **Typical Profile**

0 to 7 inches—extremely cobbly loam; 50 to 60 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-2, A-1

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC; estimated AASHTO classification—A-6

15 to 20 inches—indurated duripan; massive

20 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 20 inches

*Depth to bedrock:* 8 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.5 to 1.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing side slopes of hills

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Back slopes of hills and on fire scar areas

*Contrasting features:* Bedrock within a depth of 20 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Inclusion 3**

*Position on landscape:* Random small peaks of hills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Malpais soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Malpais Soil for Selected Uses**

*Range seeding:* Poor—too arid, small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Stingdorn Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, large stones

*Shallow excavations:* Severe—depth to bedrock, cemented pan, large stones

*Local roads and streets:* Severe—depth to bedrock, large stones

*Roadfill:* Poor—depth to bedrock, large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, cemented pan

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Malpais soil—VIIs, nonirrigated; Stingdorn soil—VIIs, nonirrigated

*Range site:* Malpais soil—024X002N; Stingdorn soil—024X002N

## 2670—Zoesta Variant-Jung-McVegas association

### Map Unit Setting

*Position on landscape:* Hills

*Elevation:* 5,800 to 7,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 100 days

### Composition

*Major components:*

- Zoesta Variant gravelly loam, 15 to 30 percent slopes—Xerollic Paleargids, fine, montmorillonitic, mesic—40 percent
  - Jung very gravelly loam, 8 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—30 percent
  - McVegas very cobbly loam, 15 to 30 percent slopes—Haplic Nadurargids, clayey-skeletal, montmorillonitic, mesic, shallow—15 percent
- Contrasting inclusions:*
- Inclusion 1: Lithic Xerollic Haplargids, 8 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—9 percent
  - Inclusion 2: Xerollic Haplargids, 8 to 15 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—3 percent
  - Inclusion 3: Rock outcrop—3 percent

### Characteristics of the Zoesta Variant Soil

*Position on landscape:* North-facing side slopes of hills

*Parent material:* Kind—residuum and colluvium; source—chert, quartzite, and extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, shadscale, bluegrass, downy rabbitbrush

*Surface cover:* 45 percent pebbles, 5 percent cobbles

### Typical Profile

- 0 to 8 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-4
- 8 to 27 inches—clay; 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CH; estimated AASHTO classification—A-7
- 27 to 36 inches—clay loam, clay; 5 to 15 percent

pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

36 to 60 inches—gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2, A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 6.3 to 8.1 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Characteristics of the Jung Soil

*Position on landscape:* South-facing crests and shoulder slopes of hills

*Parent material:* Kind—residuum; source—metavolcanic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail

### Typical Profile

- 0 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 8 to 19 inches—very cobbly clay, very gravelly clay loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; very hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7
- 19 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.9 to 2.4 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the McVegas Soil

*Position on landscape:* South-facing side slopes of hills  
*Parent material:* Kind—residuum; source—metavolcanic rocks  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, small rabbitbrush

### Typical Profile

0 to 5 inches—very cobbly loam; 35 to 45 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4  
 5 to 19 inches—very cobbly clay, very cobbly clay loam, very cobbly silty clay; 30 to 40 percent cobbles and stones and 25 to 35 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7  
 19 to 22 inches—strongly cemented duripan  
 22 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* 15 to 23 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 2.5 to 2.9 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Crests and convex side slopes of hills near rock outcrop  
*Contrasting features:* Noncalcareous throughout the profile  
*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### Inclusion 2

*Position on landscape:* Concave foot slopes of hills  
*Contrasting features:* Deep soils that have a very gravelly loam layer of clay accumulation  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Rimrock and small peaks of hills  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Zoesta Variant soil for named elements:*  
 Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Jung soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the McVegas soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Zoesta Variant Soil for Selected Uses

*Range seeding:* Poor—rooting depth, erodes easily  
*Daily cover for landfill:* Poor—hard to pack  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—too clayey, small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—hard to pack

#### Ratings of the Jung Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, hard to pack

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the McVegas Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, large stones

*Shallow excavations:* Severe—depth to bedrock, slope, cemented pan

*Local roads and streets:* Severe—low strength, slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, large stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones, thin layers, excess sodium

#### **Interpretive Groups**

*Capability classification:* Zoesta Variant soil—VIIe, nonirrigated; Jung soil—VIIs, nonirrigated; McVegas soil—VIIs, nonirrigated

*Range site:* Zoesta Variant soil—024X030N; Jung soil—024X030N; McVegas soil—024X002N

### **2681—Tessfive-Puett-Grina association**

#### **Map Unit Setting**

*Position on landscape:* Hills

*Elevation:* 5,300 to 5,700 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Tessfive gravelly loam, 8 to 30 percent slopes—Lithic Xeric Torriorthents, loamy, mixed (calcareous), mesic—45 percent

- Puett gravelly sandy loam, 15 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—25 percent

- Grina gravelly loam, 15 to 30 percent slopes,

eroded—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—15 percent

*Contrasting inclusions:*

- Inclusion 1: Orovida gravelly very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—6 percent

- Inclusion 2: Unsel Variant very gravelly loam, 15 to 30 percent slopes—Duric Haplargids, fine-loamy, mixed, mesic—5 percent

- Inclusion 3: Xeric Torriorthents, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—4 percent

#### **Characteristics of the Tessfive Soil**

*Position on landscape:* Crests and upper side slopes of hills

*Parent material:* Kind—residuum influenced by loess; source—tuffaceous sedimentary rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail, Sandberg bluegrass

*Surface cover:* 35 percent pebbles

#### **Typical Profile**

0 to 6 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); moderately saline (8 to 16 mmhos/cm); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4

6 to 16 inches—gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 30 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4

16 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 1.9 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Puett Soil**

*Position on landscape:* Eroded side slopes of hills  
*Parent material:* Kind—residuum; source—weakly consolidated, tuffaceous sediments  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, Sandberg bluegrass, Utah juniper

### **Typical Profile**

0 to 4 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones and 30 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2  
 4 to 15 inches—coarse sandy loam, gravelly sandy loam, loam; 10 to 50 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML, GM; estimated AASHTO classification—A-1, A-2, A-4  
 15 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 1.7 to 2.1 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Grina Soil**

*Position on landscape:* Lower side slopes of hills  
*Parent material:* Kind—residuum; source—soft sedimentary rocks  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Utah juniper, singleleaf pinyon, Wyoming big sagebrush

### **Typical Profile**

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SC; estimated AASHTO classification—A-6, A-4  
 3 to 14 inches—loam, silty clay loam, silt loam; 0 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
 14 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.8 to 2.6 inches  
*Water-supplying capacity:* 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, Douglas rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Interhill fan remnants  
*Contrasting features:* Soft bedrock at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Inset fan remnants  
*Contrasting features:* Very deep  
*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Woodland on the Grina soil:**

*Site index for common trees:* Singleleaf pinyon—18;  
Utah juniper—18

*Most important native understory plants:* Indian ricegrass, Thurber needlegrass, basin wildrye, bluebunch wheatgrass, big sagebrush, tapertip hawksbeard, bluegrass

**Wildlife habitat elements:**

*Suitability of the Tessfive soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Puett soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Grina soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

**Ratings of the Tessfive Soil for Selected Uses**

*Range seeding:* Poor—droughty  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Puett Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope, depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—seepage, piping

**Ratings of the Grina Soil for Selected Uses**

*Range seeding:* Poor—droughty  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—low strength, slope  
*Roadfill:* Poor—depth to bedrock, low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope, depth to bedrock

*Pond reservoir areas:* Severe—slope, depth to bedrock  
*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Tessfive soil—VII, nonirrigated; Puett soil—VIIe, nonirrigated; Grina soil—VIIe, nonirrigated

*Range site:* Tessfive soil—024X030N; Puett soil—025X025N; Grina soil—025X059N

*Woodland suitability group:* Grina soil—1D

**2711—Burrita-Burnborough association**

**Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,800 to 6,800 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 100 days

**Composition**

*Major components:*

- Burrita very cobbly loam, south aspect, 50 to 75 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—45 percent
- Burnborough very gravelly loam, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—40 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—4 percent
- Inclusion 2: Xeric Torriorthents, 4 to 15 percent slopes—Xeric Torriorthents, clayey-skeletal, montmorillonitic (calcareous), mesic—4 percent
- Inclusion 3: Burrita very cobbly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—4 percent
- Inclusion 4: Rock outcrop—3 percent

**Characteristics of the Burrita Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum; source—metamorphic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, mountain big sagebrush, lanceleaf rabbitbrush, Thurber needlegrass, bluebunch wheatgrass

**Typical Profile**

0 to 3 inches—very cobbly loam; 25 to 40 percent

cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

3 to 18 inches—very cobbly clay, very stony clay loam, very gravelly clay loam; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7

18 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.6 to 2.1 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Burnborough Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium; source—rhyolitic ash flow tuff

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail, pine bluegrass

### **Typical Profile**

0 to 17 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 45 to 60 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SC; estimated AASHTO classification—A-2

17 to 60 inches or more—very gravelly loam, very gravelly clay loam; 15 to 25 percent cobbles and stones and 40 to 65 percent pebbles (by weight);

prismatic structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 5.1 to 6.9 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower side slopes of mountains

*Contrasting features:* Very deep soils, clayey layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

#### **Inclusion 2**

*Position on landscape:* Concave inset fans at base of mountains

*Contrasting features:* Very deep soils, very gravelly clay layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

#### **Inclusion 3**

*Position on landscape:* Crests and shoulder slopes of mountains

*Contrasting features:* Slopes of 4 to 15 percent

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

#### **Inclusion 4**

*Position on landscape:* Rimrock and eroded side slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Burrita soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Burnborough soil for named elements:*

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Burrita Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Burnborough Soil for Selected Uses**

*Range seeding:* Poor—small stones, erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

**Interpretive Groups**

*Capability classification:* Burrita soil—VIIIs, nonirrigated; Burnborough soil—VIIIs, nonirrigated

*Range site:* Burrita soil—024X028N; Burnborough soil—024X021N

**2712—Burrita-Alley-Newpass association****Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition***Major components:*

- Burrita gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—35 percent

- Alley loam, 30 to 50 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—30 percent

- Newpass loam, 30 to 50 percent slopes—Haploxerollic Nadurargids, fine, montmorillonitic, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rubble land—5 percent

- Inclusion 2: Alley loam, 15 to 30 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—4 percent

- Inclusion 3: Newpass loam, 15 to 30 percent slopes—Haploxerollic Nadurargids, fine, montmorillonitic, mesic—4 percent

- Inclusion 4: Rock outcrop—2 percent

**Characteristics of the Burrita Soil**

*Position on landscape:* Crests and shoulder slopes of foothills

*Parent material:* Kind—residuum; source—metamorphic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, bottlebrush squirreltail

**Typical Profile**

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

3 to 18 inches—very cobbly clay, very stony clay loam, very gravelly clay loam; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7

18 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.6 to 2.1 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low



### **Characteristics of the Alley Soil**

*Position on landscape:* East-, west-, and south-facing side slopes of foothills

*Parent material:* Kind—colluvium influenced by loess; source—volcanic rock

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—loam; 0 to 5 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

3 to 16 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SC, GC; estimated AASHTO classification—A-6

16 to 40 inches—gravelly sandy loam, gravelly loam; 0 to 10 percent cobbles and stones and 40 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM, GM-GC, SM-SC; estimated AASHTO classification—A-2

40 to 60 inches or more—very gravelly sandy loam, very gravelly loamy sand; 0 to 10 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 6.3 to 7.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Newpass Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—residuum influenced by loess; source—metamorphic and volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard; moderately alkaline (pH 8.2); nonsaline (less than 3 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL-ML, CL; estimated AASHTO classification—A-4, A-6

5 to 17 inches—clay, silty clay; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CH; estimated AASHTO classification—A-7

17 to 24 inches—very cobbly silty clay, gravelly clay, very gravelly clay; 15 to 60 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CH; estimated AASHTO classification—A-7

24 to 34 inches—strongly cemented duripan

34 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 20 to 29 inches

*Depth to bedrock:* 21 to 36 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.9 to 3.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Stone stripes and screes on south-facing side slopes of foothills

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* East-facing lower side slopes of foothills

*Contrasting features:* Slopes of 15 to 30 percent

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* North-facing crests and shoulders of foothills

*Contrasting features:* Slopes of 15 to 30 percent

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 4**

*Position on landscape:* Rimrock on shoulder slopes of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Burrita soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Alley soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Newpass soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Burrita Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Alley Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope, cutbanks cave

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim, small stones, slope

*Pond reservoir areas:* Severe—slope, seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Newpass Soil for Selected Uses**

*Range seeding:* Rooting depth, excess salt, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, slope, shrink-swell

*Roadfill:* Poor—depth to bedrock, low strength, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Burrita soil—VIIe, nonirrigated; Alley soil—VIIe, nonirrigated; Newpass soil—VIIe, nonirrigated

*Range site:* Burrita soil—024X035N; Alley soil—024X005N; Newpass soil—024X005N

## **2721—Burnborough-Sumine-Burrita association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,800 to 7,000 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 90 days

### **Composition**

*Major components:*

- Burnborough very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—40 percent
- Sumine very cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—25 percent
- Burrita very cobbly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 50 to 75 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—7 percent
- Inclusion 2: Rock outcrop—3 percent
- Inclusion 3: Aridic Argixerolls, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—3 percent
- Inclusion 4: Rubble land—2 percent

**Characteristics of the Burnborough Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium; source—mixed tuffs

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Mountain big sagebrush, Douglas rabbitbrush, bluebunch wheatgrass, singleleaf pinyon, Utah juniper

*Surface cover:* 35 percent pebbles, 5 percent cobbles

**Typical Profile**

0 to 16 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 45 to 60 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SC; estimated AASHTO classification—A-2

16 to 60 inches or more—very gravelly loam, very gravelly clay loam; 15 to 25 percent cobbles and stones and 40 to 65 percent pebbles (by weight); prismatic structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 5.1 to 6.9 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

**Characteristics of the Sumine Soil**

*Position on landscape:* Upper, south-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—quartzite

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, pine bluegrass, singleleaf pinyon, Utah juniper

**Typical Profile**

0 to 10 inches—very cobbly loam; 20 to 55 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly clay loam, very cobbly clay loam, very gravelly loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.5 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

**Characteristics of the Burrata Soil**

*Position on landscape:* Lower side slopes of mountains

*Parent material:* Kind—residuum; source—metamorphic rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Sandberg bluegrass

**Typical Profile**

0 to 3 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very

friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

3 to 18 inches—very cobbly clay, very stony clay loam, very gravelly clay loam; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7

18 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.6 to 2.1 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Eroded, east-facing, upper side slopes of mountains

*Contrasting features:* Soft bedrock at a depth of 5 to 14 inches

*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Random, small peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Convex side slopes of mountains near rock outcrop

*Contrasting features:* Bedrock at a depth of 20 to 40 inches, clayey layer of clay accumulation

*Distinctive present vegetation:* Singleleaf pinyon, mountain big sagebrush

#### **Inclusion 4**

*Position on landscape:* Rock stringers on side slopes of mountains

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Burnborough soil for named elements:*

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Sumine soil for named elements:* Wild

herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Burrita soil for named elements:* Wild

herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Burnborough Soil for Selected Uses**

*Range seeding:* Poor—small stones, erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Burrita Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Burnborough soil—VIIIs, nonirrigated; Sumine soil—VIIIs, nonirrigated; Burrita soil—VIIIs, nonirrigated

*Range site:* Burnborough soil—024X021N; Sumine soil—024X029N; Burrita soil—024X005N

## **2760—Ginex-Burrita-Burrita, south aspect, association**

### **Map Unit Setting**

*Position on landscape:* Hills

*Elevation:* 5,600 to 6,300 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 100 days

### **Composition**

*Major components:*

- Ginex very gravelly sandy loam, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow—30 percent
- Burrita very cobbly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—30 percent
- Burrita very cobbly loam, south aspect, 30 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Xerollic Haplargids, 30 to 75 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent
- Inclusion 3: Fluvaquent Haploxerolls, 4 to 15 percent slopes—Fluvaquent Haploxerolls, fine-loamy, mixed, mesic—3 percent
- Inclusion 4: Duric Natrargids, 30 to 50 percent slopes—Duric Natrargids, clayey-skeletal, montmorillonitic, mesic—2 percent

### **Characteristics of the Ginex Soil**

*Position on landscape:* Eroded shoulders and side slopes of hills

*Parent material:* Kind—residuum; source—shales and siltstone

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Utah juniper, Wyoming big sagebrush, mountain big sagebrush, pine bluegrass

*Surface cover:* 50 percent pebbles, 5 percent cobbles

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

2 to 7 inches—very gravelly loam, very gravelly sandy clay loam; 50 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

7 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 5 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 0.6 to 0.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Burrita Soil**

*Position on landscape:* North-, west-, and east-facing shoulders and side slopes of hills

*Parent material:* Kind—colluvium over residuum; source—metamorphic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, bottlebrush squirreltail, Sandberg bluegrass, Utah juniper

### **Typical Profile**

0 to 7 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

7 to 14 inches—very cobbly clay, very stony clay loam, very gravelly clay loam; 10 to 55 percent cobbles

and stones and 45 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7

14 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.4 to 1.9 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### **Characteristics of the Burrita, South Aspect, Soil**

*Position on landscape:* South-facing side slopes of hills

*Parent material:* Kind—residuum; source—metamorphic rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass, small rabbitbrush, bluebunch wheatgrass

#### **Typical Profile**

0 to 3 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

3 to 18 inches—very cobbly clay, very stony clay loam, very gravelly clay loam; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7

18 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.6 to 2.1 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Crests and side slopes of hills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

##### **Inclusion 2**

*Position on landscape:* Convex, south-facing back slopes of hills

*Contrasting features:* Hard bedrock at a depth of 20 to 40 inches

*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue, Sandberg bluegrass

##### **Inclusion 3**

*Position on landscape:* Concave drainageways and inset fans of hills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye, rubber rabbitbrush

##### **Inclusion 4**

*Position on landscape:* Slightly concave, south-facing back slopes of hills at lower elevations

*Contrasting features:* Sodium-affected layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, shadscale

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

##### **Woodland on the Ginex soil:**

*Site index for common trees:* Utah juniper—30

*Most important native understory plants:* Indian ricegrass, bottlebrush squirreltail, Thurber needlegrass, big sagebrush, arrowleaf balsamroot

##### **Wildlife habitat elements:**

*Suitability of the Ginex soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous

plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Burrita soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Burrita, south aspect, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Ginex Soil for Selected Uses**

*Range seeding:* Poor—droughty, rooting depth, small stones

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Burrita Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Burrita, South Aspect, Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Interpretive Groups**

*Capability classification:* Ginex soil—VIIIs, nonirrigated; Burrita soil—VIIIs, nonirrigated; Burrita, south aspect, soil—VIIIs, nonirrigated

*Range site:* Ginex soil—025X059N; Burrita soil—024X005N; Burrita, south aspect, soil—024X028N  
*Woodland suitability group:* Ginex soil—1D

### **2771—Kram-Hopeka-Rock outcrop association**

#### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,200 to 7,800 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 95 days

#### **Composition**

##### *Major components:*

- Kram very gravelly very fine sandy loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—35 percent
- Hopeka very gravelly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, frigid—35 percent
- Rock outcrop—15 percent

##### *Contrasting inclusions:*

- Inclusion 1: Aridic Calcixerolls, 15 to 30 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—8 percent
- Inclusion 2: Lithic Xeric Torriorthents, 15 to 30 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—4 percent
- Inclusion 3: Durorthidic Xeric Torriorthents, 15 to 30 percent slopes—Durorthidic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—3 percent

#### **Characteristics of the Kram Soil**

*Position on landscape:* Lower side slopes of mountains

*Parent material:* Kind—residuum; source—limestone and dolomite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, black sagebrush, pine bluegrass, Indian ricegrass, small rabbitbrush

#### **Typical Profile**

0 to 3 inches—very gravelly very fine sandy loam; 10 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); granular structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
3 to 10 inches—very gravelly very fine sandy loam, very gravelly loam; 10 to 15 percent cobbles and stones

and 45 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

10 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 1.0 to 1.2 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Hopeka Soil**

*Position on landscape:* Upper side slopes of mountains

*Parent material:* Kind—residuum; source—limestone and dolomite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, bluebunch wheatgrass, pine bluegrass, arrowleaf balsamroot

#### **Typical Profile**

0 to 8 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 0.3 to 0.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Rock Outcrop**

*Position on landscape:* Side slopes of mountains

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* None

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Concave, north-facing side slopes of mountains

*Contrasting features:* Deep soils that have a thick, dark colored surface layer

*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue

##### **Inclusion 2**

*Position on landscape:* Concave side slopes of mountains

*Contrasting features:* Lower content of calcium carbonate

*Distinctive present vegetation:* Black sagebrush, pine bluegrass

##### **Inclusion 3**

*Position on landscape:* Concave drainageways of mountains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

##### **Woodland on the Kram soil:**

*Site index for common trees:* Singleleaf pinyon—25; Utah juniper—25

*Most important native understory plants:* Indian ricegrass, bottlebrush squirreltail, black sagebrush, Wyoming big sagebrush, ephedra

##### **Woodland on the Hopeka soil:**

*Site index for common trees:* Singleleaf pinyon—20; Utah juniper—20

*Most important native understory plants:* Bottlebrush squirreltail, Thurber needlegrass, bluebunch wheatgrass, black sagebrush, Wyoming big sagebrush, arrowleaf balsamroot, ephedra, bluegrass

##### **Wildlife habitat elements:**

*Suitability of the Kram soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous



plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Hopeka soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Kram Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Hopeka Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Kram soil—VIIIs, nonirrigated; Hopeka soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Kram soil—025X063N; Hopeka soil—025X063N

*Woodland suitability group:* Kram soil—1D; Hopeka soil—1D

### **2783—Desatoya, steep-Spike-Desatoya association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 105 days

#### **Composition**

##### *Major components:*

- Desatoya very gravelly sandy loam, 30 to 50 percent slopes—Durixerollic Haplargids, clayey over loamy-skeletal, montmorillonitic, mesic—35 percent

- Spike very gravelly sandy loam, 30 to 50 percent slopes—Typic Haplargids, loamy-skeletal, mixed, mesic—35 percent

- Desatoya gravelly sandy loam, 8 to 15 percent slopes—Durixerollic Haplargids, clayey over loamy-skeletal, montmorillonitic, mesic—15 percent

##### *Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 15 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—8 percent

- Inclusion 2: Durixerollic Camborthids, 4 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—4 percent

- Inclusion 3: Durixerollic Haplargids, 4 to 15 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—3 percent

#### **Characteristics of the Desatoya, Steep, Soil**

*Position on landscape:* North- and east-facing side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, bottlebrush squirreltail, Sandberg bluegrass, shadscale

#### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-2

3 to 14 inches—gravelly clay loam, gravelly clay; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7

14 to 60 inches or more—stratified extremely gravelly sandy loam to very gravelly loamy sand; 25 to 35 percent cobbles and stones and 55 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than

10); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 14 inches—slow; below this depth—moderate  
*Available water capacity:* 4.0 to 5.3 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Spike Soil**

*Position on landscape:* South- and west-facing side slopes of fan piedmont remnants  
*Parent material:* Gravelly mixed alluvium  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Wyoming big sagebrush, shadscale, small rabbitbrush, littleleaf horsebrush

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
 2 to 6 inches—very gravelly clay loam, very gravelly sandy clay, very gravelly clay; 5 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; very hard, firm; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 6 to 60 inches or more—extremely gravelly sandy clay loam, extremely gravelly clay loam, very gravelly loam; 10 to 25 percent cobbles and stones and 65 to 90 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GP-GC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.7 to 5.0 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Low

### **Characteristics of the Desatoya Soil**

*Position on landscape:* Crests and shoulder slopes of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, bottlebrush squirreltail, Sandberg bluegrass, phlox

### **Typical Profile**

0 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2, A-4  
 3 to 14 inches—gravelly clay loam, gravelly clay; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7  
 14 to 60 inches or more—stratified extremely gravelly sandy loam to very gravelly loamy sand; 25 to 35 percent cobbles and stones and 55 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* In the upper 14 inches—slow; below this depth—moderate

*Available water capacity:* 4.1 to 5.4 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly concave side slopes of fan piedmont remnants

*Contrasting features:* Noncalcareous layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Concave inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, small rabbitbrush, basin wildrye

#### **Inclusion 3**

*Position on landscape:* Slightly concave foot slopes of fan piedmont remnants

*Contrasting features:* Receives additional soil moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, small rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Desatoya, steep, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Spike soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Desatoya soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Desatoya, Steep, Soil for Selected Uses**

*Range seeding:* Poor—rooting depth, small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Spike Soil for Selected Uses**

*Range seeding:* Poor—small stones, excess salt, erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

#### **Ratings of the Desatoya Soil for Selected Uses**

*Range seeding:* Poor—rooting depth

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—large stones, slope

*Local roads and streets:* Moderate—slope, frost action, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Desatoya, steep, soil—VII<sub>1</sub>, nonirrigated; Spike soil—VII<sub>1</sub>, nonirrigated; Desatoya soil—VII<sub>1</sub>, nonirrigated

*Range site:* Desatoya, steep, soil—024X030N; Spike soil—024X045N; Desatoya soil—024X030N

## **2790—Old Camp-Minat-Osoll association**

### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,500 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Old Camp very gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—35 percent
- Minat very gravelly loam, 30 to 50 percent slopes—

Xerollic Camborthids, loamy-skeletal, mixed, mesic—30 percent

- Osoll gravelly loam, 15 to 30 percent slopes—Typic Durorthids, loamy-skeletal, mixed, mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Xerollic Haplargids, 8 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—7 percent

- Inclusion 2: Xeric Torriorthents, 4 to 15 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—4 percent

- Inclusion 3: Rock outcrop—4 percent

### **Characteristics of the Old Camp Soil**

*Position on landscape:* Crests, shoulders, and upper side slopes of foothills

*Parent material:* Kind—residuum influenced by volcanic ash; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, bottlebrush squirreltail

*Surface cover:* 50 percent pebbles

### **Typical Profile**

0 to 5 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 55 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

5 to 11 inches—very gravelly clay loam; 5 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

11 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 0.9 to 1.3 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Minat Soil**

*Position on landscape:* North- and west-facing side slopes of foothills

*Parent material:* Kind—colluvium influenced by volcanic ash; source—various kinds of rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, little rabbitbrush, bottlebrush squirreltail, pine bluegrass

### **Typical Profile**

0 to 9 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

9 to 27 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

27 to 60 inches or more—very gravelly fine sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 5.6 to 6.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Osoll Soil**

*Position on landscape:* South-facing and lower side slopes of foothills

*Parent material:* Kind—residuum and colluvium influenced by loess; source—volcanic rock

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, CL-ML; estimated AASHTO classification—A-4

5 to 12 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

12 to 35 inches—indurated duripan; platy structure; extremely hard, extremely firm

35 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 0.9 to 1.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower elevation crests and shoulder slopes of foothills

*Contrasting features:* Slopes of less than 15 percent

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 2**

*Position on landscape:* Drainageways of foothills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 3**

*Position on landscape:* Scattered peaks of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Minat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Osoll soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Minat Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

#### **Ratings of the Osoll Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope

*Local roads and streets:* Severe—slope, cemented pan  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope, cemented pan  
*Pond reservoir areas:* Severe—slope, cemented pan  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Old Camp soil—VIIIs, nonirrigated; Minat soil—VIIIs, nonirrigated; Osoll soil—VIIIs, nonirrigated  
*Range site:* Old Camp soil—024X005N; Minat soil—024X005N; Osoll soil—024X002N

## **2791—Old Camp-Colbar-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 5,000 to 6,000 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Old Camp very cobbly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—40 percent
- Colbar very cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—30 percent
- Rock outcrop—15 percent

#### *Contrasting inclusions:*

- Inclusion 1: Midraw very cobbly loam, 15 to 30 percent slopes—Xerollic Durargids, clayey, montmorillonitic, mesic, shallow—7 percent
- Inclusion 2: McVegas very gravelly loam, 4 to 15 percent slopes—Haplic Nadurargids, clayey-skeletal, montmorillonitic, mesic, shallow—5 percent
- Inclusion 3: Haploxerollic Durargids, 4 to 15 percent slopes—Haploxerollic Durargids, fine, montmorillonitic, mesic—3 percent

### **Characteristics of the Old Camp Soil**

*Position on landscape:* Summits of mountains  
*Parent material:* Kind—residuum influenced by volcanic ash; source—andesite  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, small rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 2 inches—very cobbly loam; 25 to 55 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, GM-GC, SM-SC; estimated AASHTO classification—A-4, A-2  
 2 to 14 inches—very stony clay loam, very cobbly clay loam, extremely stony clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6  
 14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.5 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of mountains  
*Parent material:* Kind—colluvium over residuum; source—andesite and dacite tuffs  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, small rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30

percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.3 to 3.8 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Shoulders and eroded side slopes of mountains

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, south-facing side slopes of mountains

*Contrasting features:* Clayey layer of clay accumulation, duripan at a depth of 10 to 20 inches

*Distinctive present vegetation:* Bluebunch wheatgrass, Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Convex, broad crests and saddles of mountains

*Contrasting features:* Sodium-affected layer of clay accumulation, duripan at a depth of 10 to 20 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Shoulder slopes of mountains

*Contrasting features:* Clayey layer of clay accumulation, duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock, large stones

*Local roads and streets:* Severe—depth to bedrock, large stones

*Roadfill:* Poor—depth to bedrock, large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Old Camp soil—VIIs, nonirrigated; Colbar soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Old Camp soil—024X005N; Colbar soil—024X005N

## **2793—Old Camp-Laped association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,400 to 6,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Old Camp very cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—55 percent
- Laped very cobbly loam, 15 to 30 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—30 percent

#### *Contrasting inclusions:*

- Inclusion 1: Lithic Xerollic Haplargids, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—7 percent
- Inclusion 2: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—5 percent
- Inclusion 3: Xerollic Camborthids, 8 to 15 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—2 percent
- Inclusion 4: Rock outcrop—1 percent

### **Characteristics of the Old Camp Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum influenced by volcanic ash; source—andesite

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, spiny hopsage, bottlebrush squirreltail

#### **Typical Profile**

0 to 2 inches—very cobbly loam; 25 to 55 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, GM-GC, SM-SC; estimated AASHTO classification—A-4, A-2

2 to 14 inches—very stony clay loam, very cobbly clay loam, extremely stony clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Laped Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—mixed tuffs

*Slope features:* Length—long; shape—slightly concave to convex

*Dominant present vegetation:* Shadscale, spiny hopsage, bottlebrush squirreltail, pine bluegrass

#### **Typical Profile**

0 to 6 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

6 to 18 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6, A-7

18 to 23 inches—indurated duripan; massive

23 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.1 to 2.5 inches

*Water-supplying capacity:* 7 inches



*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, lower, south-facing side slopes of mountains

*Contrasting features:* Slightly sodium-affected layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, shadscale

#### **Inclusion 2**

*Position on landscape:* Convex, upper, north-facing side slopes of mountains

*Contrasting features:* Deep

*Distinctive present vegetation:* Mountain big sagebrush, Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Colluvial foot slopes of mountains

*Contrasting features:* Deep

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 4**

*Position on landscape:* Random small peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Laped soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope, large stones

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Laped Soil for Selected Uses**

*Range seeding:* Poor—droughty, too arid, large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope

*Local roads and streets:* Severe—cemented pan, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones, slope

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Old Camp soil—VIIIs, nonirrigated; Laped soil—VIIIs, nonirrigated

*Range site:* Old Camp soil—024X005N; Laped soil—024X002N

## **2794—Old Camp-Kram Variant-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Hills

*Elevation:* 5,000 to 5,700 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Old Camp gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—40 percent
- Kram Variant very gravelly loam, 15 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—25 percent
- Rock outcrop—20 percent

#### **Contrasting inclusions:**

- Inclusion 1: Xerollic Durorthids, 15 to 30 percent slopes—Xerollic Durorthids, loamy-skeletal, mixed, mesic—9 percent
- Inclusion 2: Typic Camborthids, 4 to 15 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—3 percent
- Inclusion 3: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—3 percent

### **Characteristics of the Old Camp Soil**

*Position on landscape:* North-, west-, and east-facing side slopes of hills

*Parent material:* Kind—residuum; source—andesite

*Slope features:* Length—short; shape—smooth to concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Sandberg bluegrass

#### **Typical Profile**

0 to 2 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

2 to 14 inches—very stony clay loam, very cobbly clay loam, extremely stony sandy clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.5 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Kram Variant Soil**

*Position on landscape:* Summits and south-facing side slopes of hills

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, horsebrush, spiny hopsage, bottlebrush squirreltail, Indian ricegrass

*Surface cover:* 70 percent pebbles, 5 percent cobbles, 2 percent stones

#### **Typical Profile**

0 to 3 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

3 to 11 inches—extremely gravelly loam; 5 to 10 percent cobbles and stones and 70 to 80 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

11 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 0.9 to 1.3 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered peaks of hills

*Dominant present vegetation:* None

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Side slopes of rock pediments adjacent to hills

*Contrasting features:* Duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Black sagebrush

##### **Inclusion 2**

*Position on landscape:* Smooth to concave, colluvial toe slopes of hills

*Contrasting features:* Deep soils that have a noncalcareous subsoil

*Distinctive present vegetation:* Shadscale, bud sagebrush

##### **Inclusion 3**

*Position on landscape:* Concave inset fans

**Contrasting features:** Receives additional moisture from runoff

**Distinctive present vegetation:** Wyoming big sagebrush, spiny hopsage

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

**Suitability of the Old Camp soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Suitability of the Kram Variant soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Old Camp Soil for Selected Uses

**Range seeding:** Poor—droughty

**Daily cover for landfill:** Poor—depth to bedrock, small stones, slope

**Shallow excavations:** Severe—depth to bedrock, slope

**Local roads and streets:** Severe—depth to bedrock, slope

**Roadfill:** Poor—depth to bedrock

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Topsoil:** Poor—depth to bedrock, small stones, slope

**Pond reservoir areas:** Severe—depth to bedrock, slope

**Embankments, dikes, and levees:** Severe—large stones

#### Ratings of the Kram Variant Soil for Selected Uses

**Range seeding:** Poor—droughty, small stones

**Daily cover for landfill:** Poor—depth to bedrock, slope, small stones

**Shallow excavations:** Severe—depth to bedrock, slope

**Local roads and streets:** Severe—depth to bedrock, slope

**Roadfill:** Poor—depth to bedrock, slope

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Topsoil:** Poor—depth to bedrock, small stones, slope

**Pond reservoir areas:** Severe—depth to bedrock, slope

**Embankments, dikes, and levees:** Severe—thin layer

### Interpretive Groups

**Capability classification:** Old Camp soil—VIIe, nonirrigated; Kram Variant soil—VIIs, nonirrigated; Rock outcrop—VIIIs

**Range site:** Old Camp soil—024X005N; Kram Variant soil—024X047N

## 2796—Old Camp-Osoll-Colbar association

### Map Unit Setting

**Position on landscape:** Hills

**Elevation:** 5,700 to 6,000 feet

**Average annual precipitation:** About 8 inches

**Average annual air temperature:** About 48 degrees F

**Frost-free season:** About 110 days

### Composition

#### Major components:

- Old Camp gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—40 percent

- Osoll gravelly loam, 15 to 30 percent slopes—Typic Durorthids, loamy-skeletal, mixed, mesic, shallow—30 percent

- Colbar gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—15 percent

#### Contrasting inclusions:

- Inclusion 1: Typic Haplargids, 15 to 30 percent slopes—Typic Haplargids, fine-loamy, mixed, mesic—6 percent

- Inclusion 2: Lithic Camborthids, 50 to 75 percent slopes—Lithic Camborthids, loamy-skeletal, mixed, mesic—6 percent

- Inclusion 3: Lithic Xerollic Haplargids, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—3 percent

### Characteristics of the Old Camp Soil

**Position on landscape:** Crests and west-facing side slopes of hills

**Parent material:** Kind—residuum; source—andesite

**Slope features:** Length—short; shape—convex

**Dominant present vegetation:** Wyoming big sagebrush, Thurber needlegrass, Indian ricegrass

### Typical Profile

0 to 2 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

2 to 14 inches—very stony clay loam, very cobbly clay loam, extremely stony sandy clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

### Soil and Water Features

**Depth to bedrock:** 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.5 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Osoll Soil**

*Position on landscape:* South- and east-facing side slopes of hills  
*Parent material:* Kind—residuum influenced by loess; source—volcanic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 5 inches—gravelly loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, CL-ML; estimated AASHTO classification—A-4  
 5 to 12 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
 12 to 35 inches—indurated duripan; platy structure; extremely hard, extremely firm  
 35 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches  
*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 0.9 to 1.3 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of hills  
*Parent material:* Kind—residuum; source—andesite, rhyolitic tuff  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass, Indian ricegrass

### **Typical Profile**

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, GM, GM-GC; estimated AASHTO classification—A-4  
 3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
 26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex, lower side slopes of hills

*Contrasting features:* Bedrock at a depth of more than 40 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 2

*Position on landscape:* Convex, eroded side slopes of hills

*Contrasting features:* Slopes of 50 to 75 percent

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### Inclusion 3

*Position on landscape:* Convex, lower, east- and north-facing side slopes of hills

*Contrasting features:* Calcareous throughout the profile

*Distinctive present vegetation:* Black sagebrush, shadscale, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Osoll soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Old Camp Soil for Selected Uses

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, depth to bedrock

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### Ratings of the Osoll Soil for Selected Uses

*Range seeding:* Poor—too arid, erodes easily, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope

*Local roads and streets:* Severe—slope, cemented pan

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, cemented pan

*Pond reservoir areas:* Severe—slope, cemented pan

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Colbar Soil for Selected Uses

*Range seeding:* Fair—too arid, droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, small stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Old Camp soil—VIIe, nonirrigated; Osoll soil—VIIe, nonirrigated; Colbar soil—VIe, nonirrigated

*Range site:* Old Camp soil—024X005N; Osoll soil—024X002N; Colbar soil—024X005N

## 2797—Old Camp, steep-Colbar-Old Camp association

### Map Unit Setting

*Position on landscape:* Hills

*Elevation:* 5,800 to 6,200 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### Composition

#### Major components:

- Old Camp gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—45 percent
- Colbar cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—25 percent
- Old Camp very cobbly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—15 percent

#### Contrasting inclusions:

- Inclusion 1: Xerollic Camborthids, 4 to 15 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—4 percent
- Inclusion 2: Lithic Xerollic Haplargids, 8 to 30 percent

slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—4 percent

• Inclusion 3: Lithic Haplargids, 15 to 50 percent slopes—Lithic Haplargids, loamy-skeletal, mixed, mesic—4 percent

• Inclusion 4: Rock outcrop—3 percent

### **Characteristics of the Old Camp, Steep, Soil**

*Position on landscape:* Mid and lower side slopes of hills

*Parent material:* Kind—residuum; source—andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, Indian ricegrass

### **Typical Profile**

0 to 2 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

2 to 14 inches—very stony clay loam, very cobbly clay loam, extremely stony sandy clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.5 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Colbar Soil**

*Position on landscape:* Upper side slopes of hills

*Parent material:* Kind—residuum and colluvium; source—andesite, rhyolitic tuff

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—cobbly loam; 35 to 45 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam, cobbly loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.3 to 3.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Old Camp Soil**

*Position on landscape:* Crests and shoulder slopes of hills

*Parent material:* Kind—residuum; source—andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, black sagebrush

### **Typical Profile**

0 to 2 inches—very cobbly loam; 25 to 55 percent

cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, GM-GC, SM-SC; estimated AASHTO classification—A-4, A-2  
 2 to 14 inches—very stony loam, very cobbly clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6  
 14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.5 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave toe slopes of hills  
*Contrasting features:* Bedrock at a depth of more than 60 inches  
*Distinctive present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, bluegrass

#### Inclusion 2

*Position on landscape:* Slightly convex, upper elevation crests and shoulder slopes of hills  
*Contrasting features:* Calcareous subsoil  
*Distinctive present vegetation:* Bottlebrush squirreltail, black sagebrush

#### Inclusion 3

*Position on landscape:* South-facing foot slopes of hills  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale, bud sagebrush, bluegrass

#### Inclusion 4

*Position on landscape:* Scattered peaks of hills  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Old Camp, steep, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Old Camp, Steep, Soil for Selected Uses

*Range seeding:* Poor—droughty, erodes easily  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—large stones

#### Ratings of the Colbar Soil for Selected Uses

*Range seeding:* Fair—droughty, large stones, too arid  
*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—slope, large stones  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—large stones

#### Ratings of the Old Camp Soil for Selected Uses

*Range seeding:* Poor—droughty, large stones  
*Daily cover for landfill:* Poor—depth to bedrock, small stones  
*Shallow excavations:* Severe—depth to bedrock, large stones  
*Local roads and streets:* Severe—depth to bedrock, large stones  
*Roadfill:* Poor—depth to bedrock, large stones  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—large stones

### ***Interpretive Groups***

*Capability classification:* Old Camp, steep, soil—VIIe, nonirrigated; Colbar soil—VIe, nonirrigated; Old Camp soil—VIIs, nonirrigated

*Range site:* Old Camp, steep, soil—024X005N; Colbar soil—024X005N; Old Camp soil—024X005N

## **2798—Old Camp-Atlow-Osoll association**

### ***Map Unit Setting***

*Position on landscape:* Hills

*Elevation:* 5,800 to 6,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### ***Composition***

*Major components:*

- Old Camp gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—40 percent

- Atlow very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—30 percent

- Osoll very gravelly loam, 30 to 50 percent slopes—Typic Durorthids, loamy-skeletal, mixed, mesic, shallow—15 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Xerollic Haplargids, 4 to 15 percent slope—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—6 percent

- Inclusion 2: Lithic Xeric Torriorthents, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

- Inclusion 3: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—2 percent

- Inclusion 4: Rock outcrop—2 percent

### ***Characteristics of the Old Camp Soil***

*Position on landscape:* Side slopes of hills

*Parent material:* Kind—residuum influenced by loess and volcanic ash; source—andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, Indian ricegrass

### ***Typical Profile***

0 to 2 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—SM-SC; estimated AASHTO classification—A-4

2 to 14 inches—very stony clay loam, very cobbly clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

### ***Soil and Water Features***

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### ***Characteristics of the Atlow Soil***

*Position on landscape:* Upper side slopes of hills

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, spiny hopsage, bottlebrush squirreltail, Indian ricegrass

### ***Typical Profile***

0 to 3 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6

3 to 14 inches—very gravelly clay loam, very cobbly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

14 inches—unweathered bedrock

### ***Soil and Water Features***

*Depth to bedrock:* 14 to 20 inches



*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.3 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Osoll Soil**

*Position on landscape:* Eroded, lower side slopes of hills  
*Parent material:* Kind—colluvium over residuum influenced by loess; source—volcanic rock  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass, bluegrass

### **Typical Profile**

0 to 5 inches—very gravelly loam; 50 to 75 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, CL-ML; estimated AASHTO classification—A-4  
 5 to 12 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
 12 to 35 inches—indurated duripan; platy structure; extremely hard, extremely firm  
 35 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches  
*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 0.9 to 1.3 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests and shoulder slopes of hills

*Contrasting features:* Slopes of 4 to 15 percent

*Distinctive present vegetation:* Black sagebrush, bluegrass

#### **Inclusion 2**

*Position on landscape:* Colluvial side slopes of hills below rock outcrop

*Contrasting features:* Bedrock at a depth of 4 to 10 inches

*Distinctive present vegetation:* Wyoming big sagebrush, downy rabbitbrush

#### **Inclusion 3**

*Position on landscape:* Inset fans and colluvial toe slopes of hills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Big sagebrush, bluebunch wheatgrass, Thurber needlegrass

#### **Inclusion 4**

*Position on landscape:* Scattered peaks of hills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Atlow soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Osoll soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Atlow Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, erodes easily  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Osoll Soil for Selected Uses**

*Range seeding:* Poor—droughty, too arid, small stones  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope  
*Local roads and streets:* Severe—slope, depth to bedrock  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope, cemented pan  
*Pond reservoir areas:* Severe—slope, cemented pan  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Old Camp soil—VIIe, nonirrigated; Atlow soil—VIIs, nonirrigated; Osoll soil—VIIs, nonirrigated  
*Range site:* Old Camp soil—024X005N; Atlow soil—024X030N; Osoll soil—024X002N

### **2800—Old Camp-Walti-Softscrabble association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,600 to 8,000 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 70 days

#### **Composition**

*Major components:*  
 • Old Camp extremely gravelly loam, 50 to 75 percent

slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—35 percent

- Walti very cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—35 percent
  - Softscrabble very cobbly loam, 30 to 50 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—15 percent
- Contrasting inclusions:*
- Inclusion 1: Xerollic Haplargids, 8 to 15 percent slopes—Xerollic Haplargids, clayey-skeletal, mixed, frigid—7 percent
  - Inclusion 2: Rock outcrop—3 percent
  - Inclusion 3: Aridic Haploxerolls, 30 to 75 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—3 percent
  - Inclusion 4: Rubble land—2 percent

#### **Characteristics of the Old Camp Soil**

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—andesite

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, bluegrass, Thurber needlegrass

#### **Typical Profile**

- 0 to 6 inches—extremely gravelly loam; 10 to 20 percent cobbles and stones and 75 to 85 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
- 6 to 16 inches—very cobbly clay loam, very stony loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6
- 16 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.0 to 1.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Walti Soil**

*Position on landscape:* North- and east-facing shoulders and side slopes of mountains  
*Parent material:* Kind—residuum; source—rhyolite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, Idaho fescue

### **Typical Profile**

0 to 4 inches—very cobbly loam; 30 to 40 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4  
 4 to 10 inches—gravelly clay loam, clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 10 to 30 inches—clay, gravelly clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); prismatic structure; very hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7  
 30 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 3.7 to 4.8 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Softscrabble Soil**

*Position on landscape:* North- and east-facing pockets and side slopes of mountains  
*Parent material:* Kind—colluvium over residuum; source—volcanic rock  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, currant, bluebunch wheatgrass, Idaho fescue

### **Typical Profile**

0 to 16 inches—very cobbly loam; 40 to 50 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4  
 16 to 30 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7  
 30 to 60 inches—very gravelly clay loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 6.0 to 7.8 inches  
*Water-supplying capacity:* 14 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, windswept crests of mountains  
*Contrasting features:* Bedrock at a depth of 30 to 40 inches  
*Distinctive present vegetation:* Low sagebrush, black sagebrush, bluegrass

**Inclusion 2**

*Position on landscape:* Eroded side slopes and scattered peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

**Inclusion 3**

*Position on landscape:* Concave side slopes of mountains below rock outcrop and rubble land

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Oceanspray, snowberry, currant

**Inclusion 4**

*Position on landscape:* Rock stripes below Rock outcrop

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Walti soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Softscrabble soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—slope, small stones, depth to bedrock

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope, depth to bedrock

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, depth to bedrock, slope

*Pond reservoir areas:* Severe—slope, depth to bedrock

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Walti Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, slope, shrink-swell

*Roadfill:* Poor—low strength, depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer, hard to pack

**Ratings of the Softscrabble Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—slope, small stones

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim, slope, small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

**Interpretive Groups**

*Capability classification:* Old Camp soil—VIIs, nonirrigated; Walti soil—VIIs, nonirrigated; Softscrabble soil—VIIs, nonirrigated

*Range site:* Old Camp soil—024X035N; Walti soil—024X027N; Softscrabble soil—024X021N

**2801—Old Camp-Rock outcrop-Colbar association, strongly sloping****Map Unit Setting**

*Position on landscape:* Plateaus

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition****Major components:**

- Old Camp very cobbly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—50 percent

- Rock outcrop—20 percent

- Colbar very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—15 percent

**Contrasting inclusions:**

- Inclusion 1: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—6 percent

- Inclusion 2: Typic Haplargids, 15 to 30 percent slopes—Typic Haplargids, fine-loamy, mixed, mesic—6 percent

- Inclusion 3: Xerollic Haplargids, 4 to 15 percent

slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—3 percent

### **Characteristics of the Old Camp Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum; source—rhyolitic tuffs

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, ephedra, bottlebrush squirreltail, bluegrass

### **Typical Profile**

0 to 3 inches—very cobbly loam; 35 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, SM-SC, SC; estimated AASHTO classification—A-2, A-4, A-6

3 to 15 inches—very cobbly clay loam; 35 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.5 to 1.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Rimrock on shoulders and cliffs of eroded side slopes of plateaus

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* None

### **Characteristics of the Colbar Soil**

*Position on landscape:* Side slopes of plateaus

*Parent material:* Kind—residuum; source—rhyolitic tuffs

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush,

pine bluegrass, bottlebrush squirreltail, small rabbitbrush, littleleaf horsebrush

### **Typical Profile**

0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam, cobbly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.3 to 3.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, south-facing side slopes of plateaus

*Contrasting features:* Clayey layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, shadscale

#### **Inclusion 2**

*Position on landscape:* Foot slopes of plateaus

*Contrasting features:* Very deep

*Distinctive present vegetation:* Shadscale, bud sagebrush

### **Inclusion 3**

*Position on landscape:* Concave, lower, north-facing side slopes of plateaus

*Contrasting features:* Deep soils, receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, large stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Old Camp soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs; Colbar soil—VIIIs, nonirrigated

*Range site:* Old Camp soil—024X047N; Colbar soil—024X005N

## **2802—Old Camp-Rock outcrop-Colbar association, steep**

### **Map Unit Setting**

*Position on landscape:* Plateaus

*Elevation:* 5,200 to 6,200 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 105 days

### **Composition**

*Major components:*

- Old Camp extremely cobbly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—45 percent
- Rock outcrop—25 percent
- Colbar very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 15 to 30 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 2: Rubble land—3 percent
- Inclusion 3: Cumulic Haploxerolls, 8 to 15 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, mesic—2 percent

### **Characteristics of the Old Camp Soil**

*Position on landscape:* South-, east-, and west-facing side slopes of plateaus

*Parent material:* Kind—residuum and colluvium; source—tuffs

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, ephedra, bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—extremely cobbly loam; 50 to 60 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

3 to 15 inches—very cobbly clay loam; 35 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6

15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.5 to 1.9 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Rock Outcrop

*Position on landscape:* Rimrock and cliffs of plateaus  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Barren

### Characteristics of the Colbar Soil

*Position on landscape:* North-facing side slopes of plateaus  
*Parent material:* Kind—colluvium and residuum; source—tuffs  
*Slope features:* Length—long; shape—slightly concave to convex  
*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, Douglas rabbitbrush, bottlebrush squirreltail  
*Surface cover:* 10 percent pebbles, 30 percent cobbles

### Typical Profile

- 0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 3 to 22 inches—cobbly loam, gravelly clay loam, cobbly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR

less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
 26 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.10; T value—.2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly concave foot slopes of plateaus  
*Contrasting features:* Deep  
*Distinctive present vegetation:* Wyoming big sagebrush, shadscale

#### Inclusion 2

*Position on landscape:* Side slopes of plateaus below Rock outcrop  
*Contrasting features:* More than 90 percent stones on the surface  
*Distinctive present vegetation:* Barren

#### Inclusion 3

*Position on landscape:* Drainageways of plateaus  
*Contrasting features:* Very deep soil, receives additional soil moisture from runoff  
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Old Camp Soil for Selected Uses

*Range seeding:* Poor—droughty, large stones  
*Daily cover for landfill:* Poor—depth to rock, large stones, slope

*Shallow excavations:* Severe—depth to rock, slope, large stones

*Local roads and streets:* Severe—depth to rock, slope, large stones

*Roadfill:* Poor—depth to rock, slope, large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones, slope

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to rock, slope, large stones

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Old Camp soil—VIIIs, nonirrigated; Rock outcrop—VIIIs; Colbar soil—VIIIs, nonirrigated

*Range site:* Old Camp soil—024X047N; Colbar soil—024X005N

## **3071—Allor-Wieland association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 6,200 to 6,800 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 100 days

### **Composition**

*Major components:*

- Allor gravelly loam, 4 to 15 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—50 percent
- Wieland gravelly loam, 4 to 15 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—35 percent

*Contrasting inclusions:*

- Inclusion 1: Haploxerollic Durargids, 2 to 8 percent slopes—Haploxerollic Durargids, fine-loamy, mixed, mesic—7 percent
- Inclusion 2: Haploxerollic Durargids, 4 to 15 percent

slopes—Haploxerollic Durargids, fine, montmorillonitic, mesic—4 percent

- Inclusion 3: Durixerollic Haplargids, 0 to 4 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—4 percent

### **Characteristics of the Allor Soil**

*Position on landscape:* Side slopes and foot slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Thurber needlegrass

### **Typical Profile**

0 to 12 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-2, A-4

12 to 34 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6, A-7

34 to 60 inches or more—gravelly loamy sand, very gravelly loamy sand; 0 to 10 percent cobbles and stones and 35 to 55 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.7 to 6.0 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Wieland Soil**

*Position on landscape:* Summits and shoulders of fan piedmont remnants



*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—convex to smooth

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Thurber needlegrass

### Typical Profile

0 to 8 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6

8 to 20 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); prismatic structure; hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CH, SC; estimated AASHTO classification—A-7

20 to 60 inches or more—loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4, A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 5.7 to 9.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper summits of fan piedmont remnants

*Contrasting features:* Strongly cemented duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

#### Inclusion 2

*Position on landscape:* Slightly convex, upper side slopes of fan piedmont remnants

*Contrasting features:* Strongly cemented duripan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

#### Inclusion 3

*Position on landscape:* Concave drainageways on fan piedmont remnants

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Allor soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Wieland soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Allor Soil for Selected Uses

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope, frost action, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—slope, seepage

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Wieland Soil for Selected Uses

*Range seeding:* Poor—rooting depth

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey, slope

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—thin layer

### Interpretive Groups

*Capability classification:* Allor soil—VIs, nonirrigated; Wieland soil—VIs, nonirrigated

*Range site:* Allor soil—028B010N; Wieland soil—028B010N

### 3111—Ninemile-Zoesta-Itca association

#### **Map Unit Setting**

*Position on landscape:* Mountains and foothills

*Elevation:* 6,800 to 7,400 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 90 days

#### **Composition**

*Major components:*

- Ninemile extremely cobbly loam, 15 to 30 percent slopes—Lithic Argixerolls, clayey, montmorillonitic, frigid—55 percent
- Zoesta cobbly loam, 8 to 15 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—15 percent
- Itca extremely stony loam, 15 to 30 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—10 percent
- Inclusion 2: Aridic Argixerolls, 2 to 8 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—3 percent
- Inclusion 3: Punchbowl very gravelly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—2 percent

#### **Characteristics of the Ninemile Soil**

*Position on landscape:* Side slopes of mountains and foothills

*Parent material:* Kind—residuum influenced by volcanic ash; source—andesite

*Slope features:* Length—short; shape—plane to convex

*Dominant present vegetation:* Low sagebrush, Thurber needlegrass, bluegrass, Utah juniper

#### **Typical Profile**

0 to 9 inches—extremely cobbly loam; 45 to 65 percent cobbles and stones and 55 to 70 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

9 to 19 inches—clay, gravelly clay; 0 to 15 percent cobbles and stones and 0 to 35 percent pebbles (by weight); prismatic structure; hard, firm; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.0 to 3.0 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

#### **Characteristics of the Zoesta Soil**

*Position on landscape:* Colluvial foot slopes of foothills and mountains

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, downy rabbitbrush

#### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

7 to 23 inches—clay; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

23 to 31 inches—gravelly clay loam, gravelly clay; 30 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

31 to 60 inches—very gravelly clay loam, very gravelly loam; 55 to 70 percent pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 7.9 to 9.1 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Itca Soil

*Position on landscape:* Upper crests and side slopes of mountains and foothills adjacent to rock outcrop  
*Parent material:* Kind—residuum; source—volcanic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, bluegrass, Utah juniper  
*Surface cover:* 15 percent stones

### Typical Profile

0 to 9 inches—extremely stony loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6  
 9 to 17 inches—very cobbly clay loam, extremely gravelly clay; 0 to 55 percent cobbles and stones and 25 to 70 percent pebbles (by weight); prismatic structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC; estimated AASHTO classification—A-2, A-7  
 17 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.7 to 2.5 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered peaks, rimrock, and cliffs on side slopes of mountains  
*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Concave foot slopes adjacent to drainageways  
*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye, bluegrass

#### Inclusion 3

*Position on landscape:* Crests of foothills and mountains  
*Contrasting features:* Loamy throughout the profile  
*Distinctive present vegetation:* Black sagebrush, Indian ricegrass, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, woodland

#### Woodland on the Itca soil:

*Site index for common trees:* Singleleaf pinyon—70  
*Most important native understory plants:* Mountain big sagebrush, Idaho fescue, bluebunch wheatgrass

#### Wildlife habitat elements:

*Suitability of the Ninemile soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Zoesta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Itca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Ninemile Soil for Selected Uses

*Range seeding:* Poor—rooting depth, large stones

*Daily cover for landfill:* Poor—depth to rock, hard to pack, too clayey

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—depth to rock, slope, low strength

*Roadfill:* Poor—depth to rock, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, slope, small stones

*Pond reservoir areas:* Severe—slope, depth to rock

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Zoesta Soil for Selected Uses***Range seeding:* Poor—rooting depth*Daily cover for landfill:* Poor—small stones*Shallow excavations:* Moderate—too clayey, slope*Local roads and streets:* Severe—low strength, shrink-swell*Roadfill:* Fair—shrink-swell*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—small stones, area reclaim*Pond reservoir areas:* Severe—slope*Embankments, dikes, and levees:* Slight**Ratings of the Itca Soil for Selected Uses***Range seeding:* Poor—droughty, large stones*Daily cover for landfill:* Poor—depth to rock, too clayey, small stones*Shallow excavations:* Severe—slope, depth to rock, large stones*Local roads and streets:* Severe—depth to rock, large stones, slope*Roadfill:* Poor—depth to rock, large stones*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—depth to rock, small stones, too clayey*Pond reservoir areas:* Severe—depth to rock, slope*Embankments, dikes, and levees:* Severe—large stones**Interpretive Groups***Capability classification:* Ninemile soil—VIIIs, nonirrigated; Zoesta soil—VIIIs, nonirrigated; Itca soil—VIIIs, nonirrigated*Range site:* Ninemile soil—028B037N; Zoesta soil—028B045N; Itca soil—025X061N*Woodland suitability group:* Itca soil—2D**3121—Walti-Softscrabble-Bucan association****Map Unit Setting***Position on landscape:* Mountains*Elevation:* 6,500 to 8,000 feet*Average annual precipitation:* About 14 inches*Average annual air temperature:* About 45 degrees F*Frost-free season:* About 80 days**Composition***Major components:*

- Walti extremely cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—45 percent
- Softscrabble very cobbly loam, 30 to 50 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—20 percent
- Bucan very cobbly loam, 30 to 50 percent slopes—

Xerollic Haplargids, fine, montmorillonitic, frigid—20 percent

*Contrasting inclusions:*

- Inclusion 1: Cumulic Haplaquolls, drained, 2 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed (calcareous), frigid—7 percent
- Inclusion 2: Rock outcrop—4 percent
- Inclusion 3: Pachic Haploxerolls, 4 to 15 percent slopes—Pachic Haploxerolls, fine-loamy, mixed, frigid—3 percent
- Inclusion 4: Rubble land—1 percent

**Characteristics of the Walti Soil***Position on landscape:* Summits and shoulders of mountains*Parent material:* Kind—residuum; source—rhyolite, tuffs, and quartzite*Slope features:* Length—short; shape—convex*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, Idaho fescue**Typical Profile**

0 to 4 inches—extremely cobbly loam; 50 to 60 percent cobbles and stones or 60 to 75 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 10 inches—gravelly clay loam, clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

10 to 30 inches—clay, gravelly clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); prismatic structure; very hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7

30 inches—unweathered bedrock

**Soil and Water Features***Depth to bedrock:* 20 to 30 inches*Depth to seasonal high water table:* More than 60 inches*Hazard of flooding:* None*Permeability:* Very slow*Available water capacity:* 3.7 to 4.8 inches*Water-supplying capacity:* 12 inches*Runoff:* Rapid*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Softscrabble Soil**

*Position on landscape:* North-facing side slopes of mountains  
*Parent material:* Kind—colluvium over residuum; source—volcanic rock  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, currant, bluebunch wheatgrass, Idaho fescue

### **Typical Profile**

0 to 16 inches—very cobbly loam; 40 to 50 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4  
 16 to 30 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7  
 30 to 60 inches—very gravelly clay loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 6.3 to 8.4 inches  
*Water-supplying capacity:* 14 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Bucan Soil**

*Position on landscape:* South-, east-, and west-facing side slopes of mountains  
*Parent material:* Kind—residuum capped with loess influenced by volcanic ash; source—volcanic rock  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

### **Typical Profile**

0 to 5 inches—very cobbly loam; 25 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 5 to 30 inches—clay; 0 to 10 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; very hard, very firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH; estimated AASHTO classification—A-7  
 30 to 52 inches—cobbly clay, gravelly clay loam, gravelly clay; 10 to 30 percent cobbles and stones and 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-7  
 52 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 7.2 to 8.0 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—3; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Dissected drainageways and seeps of mountains

*Contrasting features:* Very deep, somewhat poorly drained

*Distinctive present vegetation:* Willow, rose, basin wildrye

**Inclusion 2**

*Position on landscape:* Rimrock on shoulders of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

**Inclusion 3**

*Position on landscape:* Concave snow pockets on north-facing side slopes of mountains

*Contrasting features:* Receives additional moisture from drifted snow

*Distinctive present vegetation:* Aspen, rose, bluegrass, mountain brome

**Inclusion 4**

*Position on landscape:* Rock stripes on side slopes of mountains

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

**Other inclusions of minor extent**

*Position on landscape:* Undissected drainageways and seeps of mountains

*Contrasting features:* Poorly drained, very deep, wet soil

*Distinctive present vegetation:* Nevada bluegrass, sedge, rush, willow

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Walti soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Softscrabble soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Bucan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Walti Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to rock, slope, hard to pack

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—low strength, slope, shrink-swell

*Roadfill:* Poor—low strength, depth to rock, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Softscrabble Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—slope, small stones

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim, slope, small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Bucan Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—large stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—low strength, shrink-swell, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—too clayey, slope, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Walti soil—VIIIs, nonirrigated; Softscrabble soil—VIIIs, nonirrigated; Bucan soil—VIIIs, nonirrigated

*Range site:* Walti soil—024X027N; Softscrabble soil—024X021N; Bucan soil—024X028N

**3122—Walti-Sumine-Softscrabble association**

**Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,500 to 8,200 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 80 days

**Composition**

*Major components:*

- Walti gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—35 percent
- Sumine cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—30 percent
- Softscrabble cobbly loam, 30 to 50 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Lithic Xerollic Haplargids, 4 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—6 percent
- Inclusion 3: Cumulic Haploxerolls, 4 to 15 percent slopes—Cumulic Haploxerolls, fine-loamy, mixed, frigid—2 percent
- Inclusion 4: Rubble land—2 percent

**Characteristics of the Walti Soil**

*Position on landscape:* Stable shoulders and west- and east-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, Idaho fescue, bluebunch wheatgrass

**Typical Profile**

- 0 to 4 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC, CL-ML; estimated AASHTO classification—A-4
- 4 to 10 inches—gravelly clay loam, clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 10 to 30 inches—clay, gravelly clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); prismatic structure; very hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7
- 30 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.7 to 4.8 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

**Characteristics of the Sumine Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

*Surface cover:* 15 percent pebbles, 15 percent cobbles

**Typical Profile**

- 0 to 10 inches—cobbly loam; 20 to 30 percent cobbles and stones and 15 to 25 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 10 to 30 inches—very gravelly clay loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7
- 30 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 3.0 to 4.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

**Characteristics of the Softscrabble Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—volcanic rock

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, currant, serviceberry, Idaho fescue

### Typical Profile

0 to 16 inches—cobbly loam; 25 to 40 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

16 to 30 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

30 to 60 inches or more—very gravelly clay loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.3 to 8.4 inches

*Water-supplying capacity:* 14 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Rimrock on shoulders and cliffs on eroded side slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### Inclusion 2

*Position on landscape:* Convex, windswept mountain crests, shoulders, and upper side slopes of mountains

*Contrasting features:* Bedrock at a depth of 10 to 20 inches

*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush

#### Inclusion 3

*Position on landscape:* Concave drainageways of mountains

*Contrasting features:* Receives additional moisture from runoff

#### Inclusion 4

*Position on landscape:* Rock stripes on side slopes of mountains

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Walti soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Softscrabble soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Walti Soil for Selected Uses

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to rock, hard to pack, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—low strength, slope, shrink-swell

*Roadfill:* Poor—low strength, depth to rock, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer, hard to pack

#### Ratings of the Sumine Soil for Selected Uses

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to rock, slope, small stones

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones



### **Ratings of the Softscrabble Soil for Selected Uses**

*Range seeding:* Poor—erodes easily  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—area reclaim, small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—large stones

### **Interpretive Groups**

*Capability classification:* Walti soil—VIIe, nonirrigated;  
 Sumine soil—VIIe, nonirrigated; Softscrabble soil—  
 VIIe, nonirrigated  
*Range site:* Walti soil—023X027N; Sumine soil—  
 024X029N; Softscrabble soil—024X021N

## **3127—Walti-Cleavage-Softscrabble association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,500 to 7,900 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 90 days

### **Composition**

#### **Major components:**

- Walti cobbly loam, 15 to 30 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—35 percent
- Cleavage extremely gravelly loam, 4 to 15 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—25 percent
- Softscrabble gravelly loam, 15 to 30 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—25 percent

#### **Contrasting inclusions:**

- Inclusion 1: Xerollic Haplargids, 8 to 15 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 2: Cumulic Haplaquolls, 2 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed (calcareous), frigid—4 percent
- Inclusion 3: Itca very stony loam, 15 to 30 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—3 percent
- Inclusion 4: Rock outcrop—3 percent

### **Characteristics of the Walti Soil**

*Position on landscape:* South-, east-, and west-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, Idaho fescue, bluebunch wheatgrass

### **Typical Profile**

0 to 4 inches—cobbly loam; 25 to 40 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 4 to 10 inches—gravelly clay loam, clay loam; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 10 to 30 inches—clay, gravelly clay; 0 to 10 percent cobbles and stones and 10 to 35 percent pebbles (by weight); prismatic structure; very hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7  
 30 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 30 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 3.7 to 4.8 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Cleavage Soil**

*Position on landscape:* Windswept crests and shoulders of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, black sagebrush, bluegrass, low rabbitbrush

### Typical Profile

0 to 4 inches—extremely gravelly loam; 0 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 0 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Softscrabble Soil

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—volcanic rock

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, serviceberry, Idaho fescue

### Typical Profile

0 to 9 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

9 to 30 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

30 to 60 inches or more—gravelly clay loam; 5 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.1 to 8.2 inches

*Water-supplying capacity:* 14 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave, north-facing toe slopes of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Wyoming and mountain big sagebrush, bluegrass

#### Inclusion 2

*Position on landscape:* Adjacent to seeps, springs, and drainageways

*Contrasting features:* Somewhat poorly drained

*Distinctive present vegetation:* Basin big sagebrush, bluebunch wheatgrass

#### Inclusion 3

*Position on landscape:* Crests of mountains near rock outcrop

*Contrasting features:* Bedrock at a depth of 10 to 20 inches, clay subsoil

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, Idaho fescue

**Inclusion 4**

*Position on landscape:* Rimrock on shoulders of mountains and scattered peaks

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Walti soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Softscrabble soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Walti Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to rock, hard to pack, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—low strength, slope, shrink-swell

*Roadfill:* Poor—low strength, depth to rock, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope, too clayey

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to rock, small stones

*Shallow excavations:* Severe—depth to rock

*Local roads and streets:* Severe—depth to rock

*Roadfill:* Poor—depth to rock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Softscrabble Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim, small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

**Interpretive Groups**

*Capability classification:* Walti soil—VIIIs, nonirrigated;

Cleavage soil—VIIIs, nonirrigated; Softscrabble soil—Vle, nonirrigated

*Range site:* Walti soil—024X027N; Cleavage soil—024X016N; Softscrabble soil—024X021N

**3134—Itca-Clan Alpine-Sumine association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 7,000 to 8,200 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 70 days

**Composition****Major components:**

- Itca extremely cobbly fine sandy loam, 15 to 30 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—35 percent
  - Clan Alpine extremely cobbly loam, 30 to 50 percent slopes—Typic Argixerolls, loamy-skeletal, mixed, frigid—25 percent
  - Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—25 percent
- Contrasting inclusions:*
- Inclusion 1: Rock outcrop and Rubble land—5 percent
  - Inclusion 2: Softscrabble gravelly loam, 15 to 50 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 3: Walti very stony fine sandy loam, 8 to 30 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—4 percent
  - Inclusion 4: Cumulic Haploxerolls, 2 to 8 percent slopes—Cumulic Haploxerolls, fine-loamy, mixed, frigid—1 percent

**Characteristics of the Itca Soil**

*Position on landscape:* Crests and side slopes of mountains adjacent to rock outcrop

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, Idaho fescue, Utah juniper

**Typical Profile**

0 to 9 inches—extremely cobbly fine sandy loam; 55 to

65 percent cobbles and stones and 45 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2

9 to 17 inches—very gravelly clay, very gravelly clay loam; 10 to 20 percent cobbles and stones and 50 to 60 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7

17 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.4 to 1.7 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Clanalpine Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—andesite, rhyolitic tuff

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, Idaho fescue, mountainmahogany

*Surface cover:* 20 percent pebbles, 40 percent cobbles, 5 percent stones

#### **Typical Profile**

0 to 12 inches—extremely cobbly loam; 45 to 55 percent cobbles and stones or 65 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

12 to 38 inches—very cobbly clay loam, very cobbly loam, very gravelly clay loam; 15 to 35 percent

cobbles and stones and 40 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

38 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.2 to 4.8 inches

*Water-supplying capacity:* 14 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Sumine Soil**

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—quartzite

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, bluegrass

#### **Typical Profile**

0 to 10 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderate

Available water capacity: 2.8 to 4.1 inches  
 Water-supplying capacity: 11 inches  
 Runoff: Rapid  
 Hydrologic group: C  
 Erosion factors (surface layer): K value—.17; T value—2; wind erodibility group—7  
 Hazard of erosion: By water—severe; by wind—slight  
 Shrink-swell potential: Low  
 Corrosivity: To steel—moderate; to concrete—low  
 Potential frost action: Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Rimrock and rock stripes on side slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface, more than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Concave, north-facing snow pockets and on side slopes of mountains

*Contrasting features:* Bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue, serviceberry

#### **Inclusion 3**

*Position on landscape:* Smooth summits of mountains

*Contrasting features:* Bedrock at a depth of 20 to 30 inches, clay subsoil

*Distinctive present vegetation:* Low sagebrush, bluegrass, Idaho fescue

#### **Inclusion 4**

*Position on landscape:* Concave drainageways of mountains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, woodland

#### **Woodland on the Itca soil:**

*Site index for common trees:* Singleleaf pinyon—65

*Most important native understory plants:* Mountain big sagebrush, Idaho fescue

#### **Woodland on the Clanalpine soil:**

*Site index for common trees:* Singleleaf pinyon—75

*Most important native understory plants:* Mountain big sagebrush, Idaho fescue

#### **Wildlife habitat elements:**

*Suitability of the Itca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous

plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Suitability of the Clanalpine soil for named elements:**

Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Suitability of the Sumine soil for named elements:**

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Itca Soil for Selected Uses**

*Range seeding:* Poor—large stones, droughty

*Daily cover for landfill:* Poor—depth to rock, too clayey, small stones

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—depth to rock, slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones, slope

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Clanalpine Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—small stones, erodes easily

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Itca soil—VIIIs, nonirrigated; Clanalpine soil—VIIIs, nonirrigated; Sumine soil—VIIIs, nonirrigated

*Range site:* Itca soil—025X061N; Clanalpine soil—025X061N; Sumine soil—024X029N

*Woodland suitability group:* Itca soil—2D; Clanalpine soil—2R

### 3150—Robson-Wiskan association

#### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,000 to 8,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 80 days

#### Composition

*Major components:*

- Robson very gravelly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—50 percent
- Wiskan gravelly loam, 15 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—35 percent

*Contrasting inclusions:*

- Inclusion 1: Aridic Argixerolls, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—10 percent
- Inclusion 2: Rock outcrop—3 percent
- Inclusion 3: Cleavage extremely gravelly very fine sandy loam, 15 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—2 percent

#### Characteristics of the Robson Soil

*Position on landscape:* Crests and west-, east-, and lower north-facing side slopes of mountains

*Parent material:* Kind—residuum; source—silicious rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, small rabbitbrush

#### Typical Profile

0 to 5 inches—very gravelly loam; 5 to 15 percent cobbles and stones and 60 to 70 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

5 to 15 inches—very cobbly clay, extremely cobbly clay; 50 to 80 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-7

15 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 0.9 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

#### Characteristics of the Wiskan Soil

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—thinly loess mantled residuum; source—chert, volcanic rock

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, Thurber needlegrass, bluebunch wheatgrass

#### Typical Profile

0 to 16 inches—gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); granular structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4

16 to 28 inches—very gravelly clay loam, very gravelly loam, extremely gravelly clay loam; 10 to 25 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

28 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.4 to 3.0 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Upper, north-facing side slopes of mountains

*Contrasting features:* Receives additional moisture from drifted snow

*Distinctive present vegetation:* Low sagebrush, Idaho fescue

#### **Inclusion 2**

*Position on landscape:* Scattered peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Upper elevation crests of mountains

*Contrasting features:* Thick, dark colored surface layer, bedrock in the upper 20 inches

*Distinctive present vegetation:* Black sagebrush, low sagebrush, Idaho fescue

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Robson soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Wiskan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Robson Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to rock, large stones, slope

*Shallow excavations:* Severe—depth to rock, large stones, slope

*Local roads and streets:* Severe—depth to rock, large stones, slope

*Roadfill:* Poor—depth to rock, large stones, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones, slope

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—large stones, thin layer

#### **Ratings of the Wiskan Soil for Selected Uses**

*Range seeding:* Poor—small stones, erodes easily

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Robson soil—VIIIs, nonirrigated; Wiskan soil—VIIe, nonirrigated

*Range site:* Robson soil—024X018N; Wiskan soil—024X031N

## **3152—Robson-Reluctan association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,200 to 7,500 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 90 days

### **Composition**

*Major components:*

- Robson cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—50 percent

- Reluctan very cobbly loam, 15 to 30 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—35 percent

*Contrasting inclusions:*

- Inclusion 1: Cumulic Haploxerolls, 2 to 8 percent slopes—Cumulic Haploxerolls, fine-loamy, mixed, frigid—7 percent

- Inclusion 2: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—6 percent

- Inclusion 3: Lithic Xerollic Haplargids, 2 to 8 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—2 percent

### **Characteristics of the Robson Soil**

*Position on landscape:* Crests and shoulders of mountains

*Parent material:* Kind—residuum; source—silicious rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, small rabbitbrush

### **Typical Profile**

0 to 7 inches—cobbly loam; 15 to 45 percent cobbles

and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SC, CL-ML, CL; estimated AASHTO classification—A-4, A-6

7 to 19 inches—very cobbly clay, extremely cobbly clay; 50 to 80 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 0.9 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Reluctant Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue

### **Typical Profile**

0 to 8 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 40 to 55 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4, A-2

8 to 33 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC,

CL; estimated AASHTO classification—A-6, A-7

33 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.0 to 5.2 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave, narrow drainageways of mountains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### **Inclusion 2**

*Position on landscape:* Slightly concave, south-facing side slopes of mountains

*Contrasting features:* Slopes of 30 to 50 percent

*Distinctive present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

#### **Inclusion 3**

*Position on landscape:* Upper, south-facing side slopes of mountains

*Contrasting features:* Layer of lime accumulation at a depth of 8 to 16 inches

*Distinctive present vegetation:* Black sagebrush, bluebunch wheatgrass, bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Robson soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Reluctant soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Robson Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to rock, large stones, slope



*Shallow excavations:* Severe—depth to rock, large stones, slope

*Local roads and streets:* Severe—depth to rock, large stones, slope

*Roadfill:* Poor—depth to rock, large stones, slope

*Sand:* Improbable source—large stones, excess fines

*Gravel:* Improbable source—large stones, excess fines

*Topsoil:* Poor—depth to rock, large stones, too clayey

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Reluctan Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Robson soil—VIIe, nonirrigated;  
Reluctan soil—VIIs, nonirrigated

*Range site:* Robson soil—024X018N; Reluctan soil—  
024X021N

### **3156—Robson-Old Camp-Rock outcrop association**

#### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,900 to 6,300 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 100 days

#### **Composition**

*Major components:*

- Robson extremely cobbly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—50 percent
- Old Camp very cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—20 percent
- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Roca extremely stony sandy loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—8 percent
- Inclusion 2: Robson extremely cobbly loam, 15 to 50

percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—5 percent

- Inclusion 3: Typic Haploxerolls, 2 to 8 percent slopes—Typic Haploxerolls, fine-loamy, mixed, mesic—2 percent

#### **Characteristics of the Robson Soil**

*Position on landscape:* Crests and upper side slopes of foothills

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, small rabbitbrush

#### **Typical Profile**

0 to 10 inches—extremely cobbly loam; 40 to 55 percent cobbles and stones or 65 to 80 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

10 to 14 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-7

14 to 19 inches—very cobbly clay, extremely cobbly clay; 50 to 80 percent cobbles and stones or 35 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 0.9 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Old Camp Soil**

*Position on landscape:* Lower side slopes of foothills

*Parent material:* Kind—residuum influenced by loess; source—andesite

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 2 inches—very cobbly loam; 25 to 55 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, GM-GC, SM-SC; estimated AASHTO classification—A-4, A-2

2 to 14 inches—very stony loam, very cobbly clay loam; 35 to 50 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.1 to 1.5 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Rock outcrop**

*Position on landscape:* Scattered peaks and cliffs of foothills

*Dominant present vegetation:* Barren

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, south-facing, upper side slopes of foothills

*Contrasting features:* Bedrock at a depth of 20 to 40 inches

*Distinctive present vegetation:* Bluebunch wheatgrass, Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Convex, north-facing, upper side slopes of foothills

*Contrasting features:* Slopes of 15 to 50 percent

*Distinctive present vegetation:* Low sagebrush, bluegrass

#### **Inclusion 3**

*Position on landscape:* Concave drainageways of foothills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Robson soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Robson Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to rock, large stones

*Shallow excavations:* Severe—depth to rock, large stones

*Local roads and streets:* Severe—depth to rock, large stones

*Roadfill:* Poor—depth to rock, large stones

*Sand:* Improbable source—large stones, excess fines

*Gravel:* Improbable source—large stones, excess fines

*Topsoil:* Poor—depth to rock, small stones

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope, large stones

*Local roads and streets:* Severe—depth to rock, slope, large stones

*Roadfill:* Poor—depth to rock, large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones, slope

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Robson soil—VIIs, nonirrigated;

Old Camp soil—VIIIs, nonirrigated; Rock outcrop soil—VIIIIs

*Range site:* Robson soil—024X018N; Old Camp soil—024X005N

### 3203—Dewar-Sodhouse-Bojo association

#### Map Unit Setting

*Position on landscape:* Plateaus and mountain valley fans

*Elevation:* 5,800 to 6,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### Composition

*Major components:*

- Dewar very gravelly loam, 2 to 8 percent slopes—Xerollic Durargids, loamy, mixed, mesic, shallow—40 percent

- Sodhouse gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Durorthids, loamy, mixed, mesic, shallow—30 percent

- Bojo gravelly loam, 15 to 50 percent, rubbly—Lithic Haplargids, loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Lithic Haplargids, 30 to 50 percent slopes—Lithic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent

#### Characteristics of the Dewar Soil

*Position on landscape:* Upper summits of mountain valley fan remnants

*Parent material:* Loess over silty alluvium

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

#### Typical Profile

0 to 4 inches—very gravelly loam; 50 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 to 14 inches—gravelly silty clay loam, gravelly clay loam; 0 to 10 percent cobbles and stones and 20 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—CL, GC; estimated AASHTO classification—A-6, A-7

14 to 50 inches or more—indurated duripan; massive; extremely hard, extremely firm

#### Soil and Water Features

*Depth to hardpan:* 13 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.9 to 2.3 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### Characteristics of the Sodhouse Soil

*Position on landscape:* Lower summits of mountain valley fan remnants

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### Typical Profile

0 to 3 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4, A-2

3 to 17 inches—fine sandy loam, loam, very fine sandy loam; 10 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 20); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

17 to 29 inches—indurated duripan; massive

29 to 60 inches or more—extremely gravelly sandy loam, very gravelly loamy sand; 5 to 20 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; very hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.1 to 2.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

**Characteristics of the Bojo Soil**

*Position on landscape:* Side slopes of plateaus  
*Parent material:* Kind—residuum; source—volcanic rock  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Wyoming big sagebrush, shadscale, bluegrass, bottlebrush squirreltail

**Typical Profile**

0 to 4 inches—gravelly loam; 25 to 40 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 4 to 10 inches—sandy clay loam, clay loam; subangular blocky structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6  
 10 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 5 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.3 to 1.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Rimrock on shoulders of plateaus  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

**Inclusion 2**

*Position on landscape:* Scarp side slopes of plateaus  
*Contrasting features:* Bedrock at a depth of 14 to 20 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, bluegrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Dewar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Sodhouse soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Bojo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Dewar Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones  
*Daily cover for landfill:* Poor—cemented pan  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan  
*Roadfill:* Poor—cemented pan  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, cemented pan  
*Pond reservoir areas:* Severe—cemented pan  
*Embankments, dikes, and levees:* Severe—piping

**Ratings of the Sodhouse Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty, excess sodium  
*Daily cover for landfill:* Poor—cemented pan, seepage, small stones  
*Shallow excavations:* Severe—cemented pan, cutbanks cave  
*Local roads and streets:* Severe—cemented pan  
*Roadfill:* Poor—cemented pan  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—cemented pan, small stones, area reclaim

*Pond reservoir areas:* Severe—cemented pan, seepage  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Bojo Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty, depth to rock  
*Daily cover for landfill:* Severe—depth to rock, slope  
*Shallow excavations:* Severe—depth to rock, slope  
*Local roads and streets:* Severe—depth to rock, slope  
*Roadfill:* Poor—depth to rock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to rock, small stones, slope  
*Pond reservoir areas:* Severe—depth to rock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Dewar soil—VIIIs, nonirrigated;  
 Sodhouse soil—VIIIs, nonirrigated; Bojo soil—VIIIs,  
 nonirrigated  
*Range site:* Dewar soil—024X005N; Sodhouse soil—  
 024X002N; Bojo soil—024X020N

### **3410—Zoesta-Wieland-Akerue association**

#### **Map Unit Setting**

*Position on landscape:* Foothills and interhill fans  
*Elevation:* 5,800 to 7,600 feet  
*Average annual precipitation:* About 11 inches  
*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 95 days

#### **Composition**

##### *Major components:*

- Zoesta cobbly loam, 8 to 15 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—40 percent
  - Wieland gravelly loam, 8 to 15 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—30 percent
  - Akerue gravelly loam, 4 to 8 percent slopes—Xerollic Durargids, clayey-skeletal, montmorillonitic, frigid, shallow—15 percent
- Contrasting inclusions:*
- Inclusion 1: Xerollic Haplargids, 15 to 30 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—7 percent
  - Inclusion 2: Xerollic Durargids, 4 to 8 percent slopes—Xerollic Durargids, clayey-skeletal, montmorillonitic, mesic—6 percent
  - Inclusion 3: Rock outcrop—2 percent

#### **Characteristics of the Zoesta Soil**

*Position on landscape:* North-facing side slopes of interhill fan remnants  
*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, downy rabbitbrush

#### **Typical Profile**

- 0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
- 7 to 23 inches—clay; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
- 23 to 31 inches—gravelly clay loam, gravelly clay; 30 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7
- 31 to 60 inches—very gravelly clay loam, very gravelly loam; 55 to 70 percent pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 7.9 to 9.1 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

#### **Characteristics of the Wieland Soil**

*Position on landscape:* South-facing side slopes of interhill fan remnants  
*Parent material:* Mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

### Typical Profile

- 0 to 8 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6
- 8 to 20 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); prismatic structure; hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CH, SC; estimated AASHTO classification—A-7
- 20 to 60 inches or more—loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4, A-2

### Soil and Water Features

*Depth to perched water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 5.7 to 9.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Akerue Soil

*Position on landscape:* Crests and shoulders of foothills  
*Parent material:* Kind—residuum; source—volcanic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, Sandberg bluegrass, bottlebrush squirreltail

### Typical Profile

- 0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC, SC, SM-SC; estimated AASHTO classification—A-4, A-6

- 3 to 15 inches—very cobbly clay, very cobbly clay loam; 30 to 50 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-7
- 15 to 21 inches—indurated duripan; massive; extremely hard, extremely firm
- 21 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* 15 to 26 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.0 to 1.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex, south-facing side slopes of foothills  
*Contrasting features:* Bedrock at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass

#### Inclusion 2

*Position on landscape:* Smooth summits of interhill fan remnants  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass, Thurber needlegrass

#### Inclusion 3

*Position on landscape:* Scattered peaks of foothills  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Zoesta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Wieland soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Akerue soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Zoesta Soil for Selected Uses**

*Range seeding:* Poor—rooting depth

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey, slope

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Fair—shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

**Ratings of the Wieland Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty, small stones

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey, slope

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—thin layer

**Ratings of the Akerue Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to rock, large stones

*Shallow excavations:* Severe—cemented pan, depth to rock

*Local roads and streets:* Severe—depth to rock

*Roadfill:* Poor—depth to rock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—cemented pan, small stones, too clayey

*Pond reservoir areas:* Severe—depth to rock, cemented pan

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Zoesta soil—VIIs, nonirrigated; Wieland soil—VIIs, nonirrigated; Akerue soil—VIIs, nonirrigated

*Range site:* Zoesta soil—024X018N; Wieland soil—024X005N; Akerue soil—024X030N

**3413—Zoesta-Reluctan association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,200 to 7,200 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 85 days

**Composition**

*Major components:*

- Zoesta cobbly loam, 30 to 50 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—60 percent
- Reluctan gravelly loam, 8 to 15 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—25 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—9 percent
- Inclusion 2: Aridic Argixerolls, 8 to 15 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—3 percent
- Inclusion 3: Rock outcrop—3 percent

**Characteristics of the Zoesta Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, downy rabbitbrush

**Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

7 to 23 inches—clay; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

23 to 31 inches—gravelly clay loam, gravelly clay; 30 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.2);

nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7  
 31 to 60 inches—very gravelly clay loam, very gravelly loam; 55 to 70 percent pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 7.9 to 9.1 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Reluctan Soil

*Position on landscape:* Crests of mountains  
*Parent material:* Kind—colluvium and residuum; source—rhyolitic tuff  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Mountain big sagebrush, bluegrass, bluebunch wheatgrass, serviceberry

### Typical Profile

0 to 13 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
 13 to 38 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7  
 38 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 4.0 to 5.2 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly concave, south-facing side slopes of mountains  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Bluebunch wheatgrass, mountain big sagebrush

#### Inclusion 2

*Position on landscape:* Concave, north-facing side slopes of mountains  
*Contrasting features:* Very gravelly texture in the upper part of the subsoil  
*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue

#### Inclusion 3

*Position on landscape:* Scattered peaks of mountains  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Zoesta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Reluctan soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

#### Ratings of the Zoesta Soil for Selected Uses

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—low strength, shrink-swell, slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope



*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Slight

### **Ratings of the Reluctant Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Poor—depth to rock, small stones

*Shallow excavations:* Severe—depth to rock

*Local roads and streets:* Moderate—depth to rock, shrink-swell, slope

*Roadfill:* Poor—depth to rock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Zoesta soil—VIIIs, nonirrigated;  
 Reluctant soil—VIIIs, nonirrigated

*Range site:* Zoesta soil—024X018N; Reluctant soil—024X021N

## **3415—Zoesta-Handy association**

### **Map Unit Setting**

*Position on landscape:* Mountain valley fans

*Elevation:* 6,300 to 7,000 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 95 days

### **Composition**

*Major components:*

- Zoesta cobbly loam, 8 to 15 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—50 percent
- Handy gravelly loam, 15 to 30 percent slopes, very stony—Xerollic Haplargids, fine, montmorillonitic, frigid—35 percent

*Contrasting inclusions:*

- Inclusion 1: Aridic Duric Haploxerolls, 15 to 30 percent slopes—Aridic Duric Haploxerolls, loamy-skeletal, mixed, frigid—6 percent
- Inclusion 2: Aridic Haploxerolls, 4 to 15 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 3: Durixerollic Haplargids, 15 to 30 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, frigid—4 percent

### **Characteristics of the Zoesta Soil**

*Position on landscape:* Lower part of mountain valley fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, downy rabbitbrush

### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

7 to 23 inches—clay; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

23 to 31 inches—gravelly clay loam, gravelly clay; 30 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

31 to 60 inches—very gravelly clay loam, very gravelly loam; 55 to 70 percent pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 7.9 to 9.1 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Handy Soil**

*Position on landscape:* Upper part of mountain valley fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, bluegrass, rabbitbrush

*Rock fragments on surface:* Kind—stones; percentage of surface covered—1 to 3

### Typical Profile

- 0 to 4 inches—gravelly loam; 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC, SC, GC; estimated AASHTO classification—A-4, A-6
- 4 to 30 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 0 to 30 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
- 30 to 60 inches or more—gravelly loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* In the upper 30 inches—slow; below this depth—moderately rapid

*Available water capacity:* 5.9 to 7.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex remnants of inset fans

*Contrasting features:* Very gravelly loam throughout the profile

*Distinctive present vegetation:* Mountain big sagebrush, bluegrass

#### Inclusion 2

*Position on landscape:* Concave inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### Inclusion 3

*Position on landscape:* Convex side slopes of mountain valley fan remnants

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Low sagebrush, bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Zoesta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Handy soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Zoesta Soil for Selected Uses

*Range seeding:* Poor—rooting depth

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Moderate—too clayey, slope

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Fair—shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

### Ratings of the Handy Soil for Selected Uses

*Range seeding:* Fair—too arid, large stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Fair—slope, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

### Interpretive Groups

*Capability classification:* Zoesta soil—VIIs, nonirrigated; Handy soil—VIIs, nonirrigated

*Range site:* Zoesta soil—024X018N; Handy soil—025X014N

## 3417—Zoesta-Loncan-Welch association

### Map Unit Setting

*Position on landscape:* Mountains and mountain valley fans

*Elevation:* 6,400 to 7,400 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 80 days

### **Composition**

#### **Major components:**

- Zoesta cobbly loam, 2 to 8 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—45 percent
- Loncan gravelly silt loam, 4 to 15 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—20 percent

- Welch silt loam, drained, 2 to 8 percent slopes, rarely flooded—Cumulic Haplaquolls, fine-loamy, mixed, frigid—20 percent

#### **Contrasting inclusions:**

- Inclusion 1: Welch silt loam, 0 to 2 percent slopes, occasionally flooded—Cumulic Haplaquolls, fine-loamy, mixed, frigid—10 percent
- Inclusion 2: Loncan extremely gravelly loam, 15 to 30 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent
- Inclusion 3: Aridic Haploxerolls, 8 to 15 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent
- Inclusion 4: Welch silt loam, frequently flooded, 0 to 2 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—1 percent

### **Characteristics of the Zoesta Soil**

*Position on landscape:* Mountain valley fan remnants bordering the mountain front

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, downy rabbitbrush

#### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

7 to 23 inches—clay; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

23 to 31 inches—gravelly clay loam, gravelly clay; 30 to

45 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

31 to 60 inches—very gravelly clay loam, very gravelly loam; 55 to 70 percent pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 7.9 to 9.1 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Loncan Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum; source—various kinds of rock

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Mountain big sagebrush, Idaho fescue, bluebunch wheatgrass

#### **Typical Profile**

0 to 14 inches—gravelly silt loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6

14 to 31 inches—very gravelly loam, extremely cobbly loam, very gravelly sandy clay loam; 10 to 45 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

31 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 21 to 38 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.3 to 3.8 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

**Characteristics of the Welch Soil**

*Position on landscape:* Inset fan remnants in narrow mountain valleys  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly concave

**Typical Profile**

0 to 4 inches—silt loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 4 to 60 inches—stratified sandy loam to silty clay loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

**Soil and Water Features**

*Depth to seasonal high water table:* March to June—48 to 72 inches; rest of year—below 72 inches  
*Hazard of flooding:* Rare  
*Permeability:* Moderately slow  
*Available water capacity:* 9.6 to 12 inches  
*Water-supplying capacity:* 13 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* High

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Outer margins of flood plains along inset fans in narrow mountain valleys  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Basin big sagebrush, Nevada bluegrass, basin wildrye

**Inclusion 2**

*Position on landscape:* Upper side slopes of mountains  
*Contrasting features:* Extremely gravelly surface layer  
*Distinctive present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

**Inclusion 3**

*Position on landscape:* Foot slopes of mountains  
*Contrasting features:* Very deep, well drained soil that lacks layer of clay accumulation

**Inclusion 4**

*Position on landscape:* Flood plains along inset fans in narrow mountain valleys  
*Contrasting features:* Frequently flooded  
*Distinctive present vegetation:* Bluegrass, tufted hairgrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Zoesta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Loncan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Welch soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

**Ratings of the Zoesta Soil for Selected Uses**

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—too clayey  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Fair—shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Moderate—slope  
*Embankments, dikes, and levees:* Slight

**Ratings of the Loncan Soil for Selected Uses**

*Range seeding:* Fair—too arid, droughty  
*Daily cover for landfill:* Poor—depth to rock, small stones

*Shallow excavations:* Depth to rock  
*Local roads and streets:* Moderate—slope, depth to rock, frost action  
*Roadfill:* Poor—depth to rock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer, large stones

#### **Ratings of the Welch Soil for Selected Uses**

*Range seeding:* Good  
*Daily cover for landfill:* Fair—too clayey  
*Shallow excavations:* Moderate—wetness  
*Local roads and streets:* Severe—low strength, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—small stones  
*Pond reservoir areas:* Moderate—slope  
*Embankments, dikes, and levees:* Slight

#### **Interpretive Groups**

*Capability classification:* Zoesta soil—VIIs, nonirrigated; Loncan soil—VIIs, nonirrigated; Welch soil—VIw, nonirrigated  
*Range site:* Zoesta soil—024X018N; Loncan soil—024X021N; Welch soil—025X003N

### **3420—Belate-Sumine-Softscrabble association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,500 to 8,000 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 90 days

#### **Composition**

##### *Major components:*

- Belate gravelly loam, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—40 percent
  - Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—25 percent
  - Softscrabble very cobbly loam, 30 to 50 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—20 percent
- Contrasting inclusions:*
- Inclusion 1: Lithic Haploxerolls, 0 to 4 percent

slopes—Lithic Haploxerolls, loamy-skeletal, mixed, frigid—8 percent

- Inclusion 2: Rubble land—4 percent
- Inclusion 3: Rock outcrop—3 percent

#### **Characteristics of the Belate Soil**

*Position on landscape:* North-facing, upper side slopes of mountains  
*Parent material:* Kind—colluvium; source—rhyolitic tuff, andesite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, Idaho fescue

#### **Typical Profile**

- 0 to 14 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
- 14 to 60 inches or more—very gravelly loam, very gravelly clay loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 6.9 to 8.6 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

#### **Characteristics of the Sumine Soil**

*Position on landscape:* South-facing side slopes of mountains  
*Parent material:* Kind—residuum; source—andesite  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Bluebunch wheatgrass, mountain big sagebrush

### Typical Profile

- 0 to 10 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 40 to 55 percent pebbles (by weight); granular structure; soft, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
- 10 to 30 inches—very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7
- 30 inches—unweathered bedrock

### Soil and Water Features

- Depth to bedrock:* 20 to 40 inches
- Depth to seasonal high water table:* More than 60 inches
- Hazard of flooding:* None
- Permeability:* Moderate
- Available water capacity:* 2.8 to 4.1 inches
- Water-supplying capacity:* 11 inches
- Runoff:* Rapid
- Hydrologic group:* C
- Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7
- Hazard of erosion:* By water—severe; by wind—slight
- Shrink-swell potential:* Low
- Corrosivity:* To steel—moderate; to concrete—low
- Potential frost action:* Moderate

### Characteristics of the Softscrabble Soil

- Position on landscape:* North-facing, lower side slopes of mountains
- Parent material:* Kind—residuum and colluvium; source—volcanic rock
- Slope features:* Length—short; shape—convex
- Dominant present vegetation:* Idaho fescue, mountain big sagebrush, serviceberry

### Typical Profile

- 0 to 16 inches—very cobbly loam; 40 to 50 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4
- 16 to 30 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure;

hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

- 30 to 60 inches or more—very gravelly clay loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

### Soil and Water Features

- Depth to seasonal high water table:* More than 60 inches
- Hazard of flooding:* None
- Permeability:* Slow
- Available water capacity:* 6.0 to 7.8 inches
- Water-supplying capacity:* 14 inches
- Runoff:* Rapid
- Hydrologic group:* C
- Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—8
- Hazard of erosion:* By water—moderate; by wind—slight
- Shrink-swell potential:* Low
- Corrosivity:* To steel—moderate; to concrete—low
- Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

- Position on landscape:* Convex crests of mountains
- Contrasting features:* Bedrock at a depth of less than 20 inches
- Distinctive present vegetation:* Low sagebrush, black sagebrush

#### Inclusion 2

- Position on landscape:* Side slopes of mountains below rock outcrop
- Contrasting features:* More than 90 percent stones on the surface
- Distinctive present vegetation:* Barren

#### Inclusion 3

- Position on landscape:* Scattered peaks and rimrock on side slopes of mountains
- Contrasting features:* Bedrock exposed at the soil surface
- Distinctive present vegetation:* Barren

### Ratings of the Belate Soil for Selected Uses

- Range seeding:* Poor—erodes easily
- Daily cover for landfill:* Poor—small stones, slope
- Shallow excavations:* Severe—slope
- Local roads and streets:* Severe—slope
- Roadfill:* Poor—slope
- Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Slight

#### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—small stones, erodes easily  
*Daily cover for landfill:* Poor—depth to rock, small stones, slope  
*Shallow excavations:* Severe—depth to rock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to rock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Softscrabble Soil for Selected Uses**

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—slope, small stones  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Poor—slope  
*Embankments, dikes, and levees:* Severe—large stones

#### **Interpretive Groups**

*Capability classification:* Belate soil—VIIe, nonirrigated;  
 Sumine soil—VIIs, nonirrigated; Softscrabble soil—  
 VIIs, nonirrigated  
*Range site:* Belate soil—024X027N; Sumine soil—  
 024X029N; Softscrabble soil—024X021N

### **3423—Belate-Cleavage-Softscrabble association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,500 to 7,800 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 70 days

#### **Composition**

##### *Major components:*

- Belate very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—35 percent
- Cleavage extremely gravelly loam, 15 to 30 percent

slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—30 percent

- Softscrabble gravelly loam, 15 to 30 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—20 percent

##### *Contrasting inclusions:*

- Inclusion 1: Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—9 percent
- Inclusion 2: Rock outcrop—3 percent
- Inclusion 3: Welch loam, drained, 2 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—2 percent
- Inclusion 4: Welch loam, 2 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—1 percent

#### **Characteristics of the Belate Soil**

*Position on landscape:* Upper side slopes of mountains  
*Parent material:* Kind—colluvium; source—rhyolitic tuff, andesite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, Idaho fescue

#### **Typical Profile**

- 0 to 14 inches—very gravelly loam; 5 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
- 14 to 60 inches or more—very gravelly loam, very gravelly clay loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 6.9 to 8.6 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Cleavage Soil**

*Position on landscape:* Windswept crests and shoulders of mountains

*Parent material:* Kind—residuum; source—extrusive volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, black sagebrush, bluegrass

### **Typical Profile**

0 to 4 inches—extremely gravelly loam; 0 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 15 inches—very cobbly clay loam, extremely gravelly clay loam, very gravelly loam; 0 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.6 to 1.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Softscrabble Soil**

*Position on landscape:* Mid and lower side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Idaho fescue, serviceberry

### **Typical Profile**

0 to 9 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

9 to 30 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

30 to 60 inches or more—gravelly clay loam; 5 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 6.1 to 8.2 inches

*Water-supplying capacity:* 14 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Plane to convex, south-facing side slopes of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

#### **Inclusion 2**

*Position on landscape:* Rimrock and cliffs on eroded side slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren



**Inclusion 3**

*Position on landscape:* Entrenched drainageways of mountains

*Contrasting features:* Somewhat poorly drained soil with slopes of 2 to 8 percent

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

**Inclusion 4**

*Position on landscape:* Narrow drainageways of mountains

*Contrasting features:* Poorly drained; slopes of 2 to 8 percent

*Distinctive present vegetation:* Tufted hairgrass, Nevada bluegrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Belate soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Softscrabble soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Belate Soil for Selected Uses**

*Range seeding:* Poor—small stones, erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

**Ratings of the Cleavage Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—depth to rock, slope

*Roadfill:* Poor—slope, depth to rock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones, slope

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Softscrabble Soil for Selected Uses**

*Range seeding:* Fair—erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—area reclaim, small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

**Interpretive Groups**

*Capability classification:* Belate soil—VIIIs, nonirrigated;

Cleavage soil—VIIIs, nonirrigated; Softscrabble soil—Vle, nonirrigated

*Range site:* Belate soil—024X027N; Cleavage soil—024X016N; Softscrabble soil—024X021N

**3432—Bregar-Roca-Quarz association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,200 to 7,600 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 80 days

**Composition****Major components:**

- Bregar very cobbly loam, 50 to 75 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—35 percent

- Roca very gravelly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—30 percent

- Quarz extremely gravelly loam, 15 to 30 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—20 percent

**Contrasting inclusions:**

- Inclusion 1: Aridic Haploxerolls, 15 to 30 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—10 percent

- Inclusion 2: Lithic Xerollic Haplargids, 30 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—5 percent

**Characteristics of the Bregar Soil**

*Position on landscape:* East- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, low sagebrush, Idaho fescue

**Typical Profile**

- 0 to 4 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 55 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, CL-ML, CL; estimated AASHTO classification—A-4, A-2, A-6
- 4 to 11 inches—very gravelly clay loam, extremely gravelly loam, extremely cobbly sandy clay loam; 0 to 40 percent cobbles and stones and 50 to 80 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 11 inches—unweathered bedrock

**Soil and Water Features**

- Depth to bedrock:* 5 to 12 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.0 to 1.3 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

**Characteristics of the Roca Soil**

- Position on landscape:* South-facing side slopes of mountains  
*Parent material:* Kind—residuum; source—chert and shale  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Bluebunch wheatgrass, mountain big sagebrush

**Typical Profile**

- 0 to 5 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

- 5 to 27 inches—very gravelly clay loam, very gravelly clay; 0 to 15 percent cobbles and stones and 50 to 60 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2
- 27 inches—unweathered bedrock

**Soil and Water Features**

- Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 2.9 to 3.6 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

**Characteristics of the Quarz Soil**

- Position on landscape:* North-facing side slopes of mountains  
*Parent material:* Kind—residuum; source—shale and sandstone  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, Wyoming big sagebrush, Thurber needlegrass, bluebunch wheatgrass

**Typical Profile**

- 0 to 7 inches—extremely gravelly loam; 0 to 15 percent cobbles and stones and 75 to 90 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GP-GC; estimated AASHTO classification—A-2
- 7 to 26 inches—very gravelly clay, very gravelly clay loam; 0 to 25 percent cobbles and stones and 50 to 75 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7
- 26 inches—unweathered bedrock

**Soil and Water Features**

- Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 2.2 to 2.7 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, north-facing side slopes of mountains  
*Contrasting features:* Layer of lime accumulation at a depth of 20 to 30 inches  
*Distinctive present vegetation:* Black sagebrush, Idaho fescue

#### **Inclusion 2**

*Position on landscape:* Crests and shoulders of mountains  
*Contrasting features:* Very gravelly clay subsoil  
*Distinctive present vegetation:* Low sagebrush, Idaho fescue

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Bregar soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Roca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Quarz soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Bregar Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones, depth to rock  
*Daily cover for landfill:* Poor—depth to rock, small stones, slope  
*Shallow excavations:* Severe—depth to rock, slope  
*Local roads and streets:* Severe—depth to rock, slope  
*Roadfill:* Poor—depth to rock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to rock, small stones, slope  
*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Roca Soil for Selected Uses**

*Range seeding:* Poor—small stones  
*Daily cover for landfill:* Poor—depth to rock, small stones, slope  
*Shallow excavations:* Severe—slope, depth to rock  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to rock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope, too clayey  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Quarz Soil for Selected Uses**

*Range seeding:* Poor—small stones  
*Daily cover for landfill:* Poor—depth to rock, slope, small stones  
*Shallow excavations:* Severe—depth to rock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to rock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope, too clayey  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—thin layer, large stones

### **Interpretive Groups**

*Capability classification:* Bregar soil—VIIIs, nonirrigated; Roca soil—VIIIs, nonirrigated; Quarz soil—VIIIs, nonirrigated  
*Range site:* Bregar soil—024X016N; Roca soil—025X015N; Quarz soil—025X014N

## **3433—Bregar-Punchbowl association**

### **Map Unit Setting**

*Position on landscape:* Foothills  
*Elevation:* 6,500 to 6,900 feet  
*Average annual precipitation:* About 11 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 90 days

### **Composition**

#### **Major components:**

- Bregar very gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—45 percent
  - Punchbowl gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—40 percent
- Contrasting inclusions:*
- Inclusion 1: Bregar extremely cobbly loam, 4 to 15

percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—5 percent

- Inclusion 2: Rock outcrop—4 percent
- Inclusion 3: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, fine-loamy, mixed, frigid—3 percent
- Inclusion 4: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—3 percent

### **Characteristics of the Bregar Soil**

*Position on landscape:* Crests and shoulders of foothills

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, low sagebrush, Idaho fescue

*Surface cover:* 35 percent pebbles, 35 percent cobbles

### **Typical Profile**

- 0 to 4 inches—very gravelly loam; 10 to 20 percent cobbles and stones and 45 to 60 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-2, A-6
- 4 to 11 inches—very gravelly clay loam, extremely cobbly clay loam, very gravelly sandy clay loam; 5 to 45 percent cobbles and stones and 65 to 75 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 11 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 5 to 12 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.0 to 1.3 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Punchbowl Soil**

*Position on landscape:* Broad summits of foothills

*Parent material:* Kind—residuum; source—andesite, rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bluegrass, phlox, Utah juniper

### **Typical Profile**

- 0 to 3 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4, A-2
- 3 to 6 inches—gravelly loam, loam; 0 to 5 percent cobbles and stones and 5 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6
- 6 to 10 inches—gravelly clay loam, gravelly sandy clay loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7
- 10 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.2 to 1.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex upper side slopes of foothills

*Contrasting features:* Extremely cobbly soil surface

*Distinctive present vegetation:* Black sagebrush, low sagebrush, Idaho fescue

**Inclusion 2**

*Position on landscape:* Scattered peaks of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

**Inclusion 3**

*Position on landscape:* Concave drainageways of foothills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Big sagebrush, Thurber needlegrass, bluebunch wheatgrass

**Inclusion 4**

*Position on landscape:* Smooth, north-facing side slopes of foothills

*Contrasting features:* Deep soil with higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Bregar soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Punchbowl soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Bregar Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, depth to rock

*Daily cover for landfill:* Poor—small stones, depth to rock

*Shallow excavations:* Severe—depth to rock

*Local roads and streets:* Severe—depth to rock

*Roadfill:* Poor—depth to rock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Punchbowl Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to rock, small stones

*Shallow excavations:* Severe—depth to rock

*Local roads and streets:* Severe—depth to rock

*Roadfill:* Poor—depth to rock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones

*Pond reservoir areas:* Severe—depth to rock

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Bregar soil—VIIIs, nonirrigated;

Punchbowl soil—VIIIs, nonirrigated

*Range site:* Bregar soil—024X016N; Punchbowl soil—024X030N

**3451—Reluctan-Robson-Sumine association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,400 to 6,600 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 90 days

**Composition****Major components:**

- Reluctan very cobbly loam, 15 to 30 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—40 percent
- Robson very cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—25 percent
- Sumine very cobbly loam, 15 to 30 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—20 percent

**Contrasting inclusions:**

- Inclusion 1: Typic Argixerolls, 15 to 30 percent slopes—Typic Argixerolls, loamy-skeletal, mixed, frigid—7 percent
- Inclusion 2: Rock outcrop—3 percent
- Inclusion 3: Cumulic Haploxerolls, 2 to 8 percent slopes—Cumulic Haploxerolls, fine-loamy, mixed, frigid—3 percent
- Inclusion 4: Rubble land—2 percent

**Characteristics of the Reluctan Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Mountain big sagebrush, Thurber needlegrass, Idaho fescue

**Typical Profile**

0 to 8 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 40 to 55 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4, A-2

8 to 33 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

33 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.0 to 5.2 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Robson Soil**

*Position on landscape:* Summits and shoulders of mountains

*Parent material:* Kind—residuum; source—silicious rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, small rabbitbrush

### **Typical Profile**

0 to 10 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, SM-SC, SC; estimated AASHTO classification—A-2

10 to 14 inches—very cobbly clay loam; 30 to 45 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-7

14 to 19 inches—very cobbly clay, extremely cobbly clay; 50 to 80 percent cobbles and stones and 35 to

50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 0.9 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Sumine Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—quartzite

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

### **Typical Profile**

0 to 10 inches—very cobbly loam; 30 to 55 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly clay loam, very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 2.5 to 3.6 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Very rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave side slopes of mountains  
*Contrasting features:* Receives additional moisture from drifted snow  
*Distinctive present vegetation:* Mountain big sagebrush, snowberry, Idaho fescue

#### **Inclusion 2**

*Position on landscape:* Cliffs on eroded side slopes and scattered peaks of mountains  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

#### **Inclusion 3**

*Position on landscape:* Inset fans along drainageways of mountains  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye, Nevada bluegrass

#### **Inclusion 4**

*Position on landscape:* Rock stripes on side slopes of mountains below rock outcrop  
*Contrasting features:* More than 90 percent stones on the surface  
*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Reluctan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Robson soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Reluctan Soil for Selected Uses**

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—depth to rock, small stones, slope  
*Shallow excavations:* Severe—depth to rock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to rock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Robson Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones  
*Daily cover for landfill:* Poor—depth to rock, large stones, slope  
*Shallow excavations:* Severe—depth to rock, large stones, slope  
*Local roads and streets:* Severe—depth to rock, large stones, slope  
*Roadfill:* Poor—depth to rock, large stones, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to rock, small stones, slope  
*Pond reservoir areas:* Severe—depth to rock, slope  
*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—depth to rock, small stones, slope  
*Shallow excavations:* Severe—depth to rock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to rock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Reluctan soil—VIIIs, nonirrigated; Robson soil—VIIIs, nonirrigated; Sumine soil—VIIIs, nonirrigated  
*Range site:* Reluctan soil—024X021N; Robson soil—024X018N; Sumine soil—024X029N

## **3452—Reluctan-Sumine-Colbar association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 5,400 to 6,600 feet  
*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 90 days

### **Composition**

#### *Major components:*

- Reluctan cobbly loam, 15 to 30 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—45 percent
- Sumine very cobbly loam, 15 to 30 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—25 percent
- Colbar very cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—5 percent
- Inclusion 2: Aridic Haploxerolls, 4 to 15 percent slopes—Aridic Haploxerolls, fine-loamy, mixed, frigid—5 percent

### **Characteristics of the Reluctan Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—smooth to slightly concave

*Dominant present vegetation:* Mountain big sagebrush, Thurber needlegrass, Idaho fescue

#### **Typical Profile**

0 to 8 inches—cobbly loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

8 to 33 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

33 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 4.0 to 5.2 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Sumine Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—breccia

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

#### **Typical Profile**

0 to 10 inches—very cobbly loam; 30 to 55 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

10 to 30 inches—very gravelly clay loam, very gravelly loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.5 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate



### **Characteristics of the Colbar Soil**

*Position on landscape:* Lower side slopes of mountains

*Parent material:* Kind—colluvium; residuum over source—rhyolitic tuff

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass, bluegrass

### **Typical Profile**

0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.3 to 3.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Upper side slopes of mountains

*Contrasting features:* Clayey subsoil

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper

#### **Inclusion 2**

*Position on landscape:* Fanlettes at the base of mountains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Reluctan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Reluctan Soil for Selected Uses**

*Range seeding:* Fair—large stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to rock, slope, large stones

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—slope, large stones  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Reluctan soil—VIIIs, nonirrigated; Sumine soil—VIIIs, nonirrigated; Colbar soil—VIIIs, nonirrigated  
*Range site:* Reluctan soil—024X021N; Sumine soil—024X029N; Colbar soil—024X005N

## **3453—Reluctan-Locane-Itca association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,500 to 7,600 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 80 days

### **Composition**

#### *Major components:*

- Reluctan very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—35 percent
  - Locane extremely gravelly sandy loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—25 percent
  - Itca very cobbly loam, 15 to 30 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—25 percent
- Contrasting inclusions:*
- Inclusion 1: Softscrabble gravelly loam, 15 to 30 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—7 percent
  - Inclusion 2: Xerollic Haplargids, 15 to 30 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—5 percent
  - Inclusion 3: Welch loam, drained, 2 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—2 percent
  - Inclusion 4: Rock outcrop—1 percent

### **Characteristics of the Reluctan Soil**

*Position on landscape:* North-, west-, and east-facing side slopes of mountains  
*Parent material:* Kind—colluvium over residuum; source—rhyolitic tuff  
*Slope features:* Length—short; shape—smooth, slightly concave

*Dominant present vegetation:* Mountain big sagebrush, Thurber needlegrass, Idaho fescue

### **Typical Profile**

0 to 8 inches—very gravelly loam; 10 to 25 percent cobbles and stones and 45 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4, A-2  
 8 to 33 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7  
 33 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 4.0 to 5.2 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Locane Soil**

*Position on landscape:* South-facing side slopes of mountains  
*Parent material:* Kind—residuum; source—tuffaceous conglomerate  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Big sagebrush, Thurber needlegrass, bluebunch wheatgrass, singleleaf pinyon

### **Typical Profile**

0 to 6 inches—extremely gravelly sandy loam; 5 to 20 percent cobbles and stones and 75 to 85 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

6 to 14 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7  
 14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.4 to 1.9 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Itca Soil

*Position on landscape:* Crests, shoulders, and upper side slopes of mountains and areas adjacent to rock outcrop  
*Parent material:* Kind—residuum; source—rhyolitic tuff  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, Idaho fescue, Utah juniper

### Typical Profile

0 to 9 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6  
 9 to 17 inches—very cobbly clay loam, very gravelly clay, extremely gravelly clay; 0 to 55 percent cobbles and stones and 25 to 70 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC; estimated AASHTO classification—A-2, A-7  
 17 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.7 to 2.2 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave, north-facing back slopes of mountains  
*Contrasting features:* Receives additional moisture from drifted snow  
*Distinctive present vegetation:* Serviceberry, mountain big sagebrush, mountain brome

#### Inclusion 2

*Position on landscape:* Convex lower side slopes of mountains  
*Contrasting features:* Clayey subsoil with bedrock at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Low sagebrush, Thurber needlegrass

#### Inclusion 3

*Position on landscape:* Concave inset fans along drainageways of mountains  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

#### Inclusion 4

*Position on landscape:* Scattered peaks of mountains  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat, woodland

#### Woodland on the Itca soil:

*Site index for common trees:* Singleleaf pinyon—70

#### Wildlife habitat elements:

*Suitability of the Reluctant soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Locane soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Itca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Reluctan Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Locane Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—depth to rock, slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones, slope

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Itca Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to rock, small stones, too clayey

*Shallow excavations:* Severe—slope, depth to rock, large stones

*Local roads and streets:* Severe—slope, depth to rock, large stones

*Roadfill:* Poor—depth to rock, slope, large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—too clayey, depth to rock, small stones

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—thin layer, large stones

#### **Interpretive Groups**

*Capability classification:* Reluctan soil—VIIIs, nonirrigated; Locane soil—VIIIs, nonirrigated; Itca soil—VIIIs, nonirrigated

*Range site:* Reluctan soil—024X021N; Locane soil—024X035N; Itca soil—025X061N

*Woodland suitability group:* Itca soil—2D

### **3455—Reluctan-Roca-Colbar association**

#### **Map Unit Setting**

*Position on landscape:* Mountains and foothills

*Elevation:* 5,400 to 6,400 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 95 days

#### **Composition**

*Major components:*

- Reluctan very cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—40 percent
- Roca very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—30 percent

- Colbar cobbly loam, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—7 percent
- Inclusion 2: Pachic Haploxerolls, 30 to 50 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—3 percent
- Inclusion 3: Lithic Xeric Torriorthents, 8 to 30 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—3 percent
- Inclusion 4: Lithic Xerollic Haplargids, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—2 percent

#### **Characteristics of the Reluctan Soil**

*Position on landscape:* North-facing side slopes of mountains and foothills

*Parent material:* Kind—colluvium and residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—smooth to slightly concave

*Dominant present vegetation:* Mountain big sagebrush, Thurber needleglass, Idaho fescue

#### **Typical Profile**

0 to 8 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 40 to 55 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4, A-2

8 to 33 inches—gravelly clay loam, gravelly loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7  
33 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 4.0 to 5.2 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Roca Soil**

*Position on landscape:* South-facing side slopes of mountains and foothills  
*Parent material:* Kind—residuum; source—chert  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Wyoming big sagebrush

### **Typical Profile**

0 to 5 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
5 to 27 inches—very gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2  
27 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 2.9 to 3.6 inches  
*Water-supplying capacity:* 11 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Colbar Soil**

*Position on landscape:* Lower side slopes of foothills  
*Parent material:* Kind—colluvium over residuum; source—rhyolitic tuff  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass, bluegrass

### **Typical Profile**

0 to 3 inches—cobbly loam; 35 to 45 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests and shoulders of mountains and foothills

*Contrasting features:* Bedrock at a depth of 10 to 20 inches

*Distinctive present vegetation:* Black sagebrush, bluebunch wheatgrass, bluegrass

#### **Inclusion 2**

*Position on landscape:* Concave snow pockets on north-facing side slopes of mountains and foothills

*Contrasting features:* Receives additional moisture from drifted snow

*Distinctive present vegetation:* Snowberry, mountain big sagebrush, Idaho fescue

#### **Inclusion 3**

*Position on landscape:* Lower, eroded side slopes of mountains and foothills

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, small rabbitbrush

#### **Inclusion 4**

*Position on landscape:* Scattered peaks

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Reluctant soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Roca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Reluctant Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Roca Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—slope, depth to rock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Fair—droughty, large stones

*Daily cover for landfill:* Poor—depth to rock, slope, large stones

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* Reluctant soil—VIIIs, nonirrigated; Roca soil—VIIIs, nonirrigated; Colbar soil—VIe, nonirrigated

*Range site:* Reluctant soil—024X021N; Roca soil—024X028N; Colbar soil—024X005N

## **3560—Locane-Robson-Bregar association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,400 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Locane very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—45 percent

- Robson gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—25 percent

- Bregar extremely gravelly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—15 percent

*Contrasting inclusions:*

- Inclusion 1: Aridic Duric Haploxerolls, 30 to 75 percent slopes—Aridic Duric Haploxerolls, loamy-skeletal, mixed, frigid—6 percent

- Inclusion 2: Glean silt loam, 30 to 75 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent

- Inclusion 3: Rock outcrop—3 percent

- Inclusion 4: Xerollic Camborthids, 30 to 50 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, frigid—1 percent

### **Characteristics of the Locane Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum; source—tuffaceous conglomerate

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Big sagebrush, Thurber needlegrass, bluebunch wheatgrass

### **Typical Profile**

0 to 6 inches—very gravelly loam; 5 to 15 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

6 to 14 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.4 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Robson Soil**

*Position on landscape:* Predominately north-facing side slopes of mountains

*Parent material:* Kind—residuum; source—silicious rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, small rabbitbrush

### **Typical Profile**

0 to 7 inches—gravelly loam; 5 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SC, CL-ML, CL; estimated AASHTO classification—A-4, A-6

7 to 19 inches—very cobbly clay, extremely cobbly clay; 50 to 80 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 0.9 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Bregar Soil**

*Position on landscape:* Crests of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, low sagebrush, Idaho fescue

**Typical Profile**

- 0 to 4 inches—extremely gravelly loam; 10 to 20 percent cobbles and stones and 70 to 80 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2
- 4 to 11 inches—very gravelly clay loam, extremely cobbly clay loam, very gravelly sandy clay loam; 5 to 45 percent cobbles and stones and 65 to 75 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 11 inches—unweathered bedrock

**Soil and Water Features**

- Depth to bedrock:* 5 to 12 inches
- Depth to seasonal high water table:* More than 60 inches
- Hazard of flooding:* None
- Permeability:* Moderately slow
- Available water capacity:* 1.0 to 1.3 inches
- Water-supplying capacity:* 9 inches
- Runoff:* Medium
- Hydrologic group:* D
- Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8
- Hazard of erosion:* By water—moderate; by wind—slight
- Shrink-swell potential:* Low
- Corrosivity:* To steel—moderate; to concrete—low
- Potential frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

- Position on landscape:* Concave snow pockets on north-facing side slopes of mountains
- Contrasting features:* Receives additional moisture from drifted snow
- Distinctive present vegetation:* Snowberry, mountain big sagebrush, Idaho fescue

**Inclusion 2**

- Position on landscape:* Concave lower side slopes of mountains
- Contrasting features:* Bedrock at a depth of more than 40 inches
- Distinctive present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

**Inclusion 3**

- Position on landscape:* Scattered peaks
- Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

**Inclusion 4**

- Position on landscape:* Lower, south-facing side slopes of mountains
- Contrasting features:* Lacks layer of clay accumulation; higher water-supplying capacity
- Distinctive present vegetation:* Black sagebrush, bluebunch wheatgrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

- Suitability of the Locane soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
- Suitability of the Robson soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
- Suitability of the Bregar soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Locane Soil for Selected Uses**

- Range seeding:* Poor—droughty, small stones
- Daily cover for landfill:* Poor—depth to rock, small stones, slope
- Shallow excavations:* Severe—depth to rock, slope
- Local roads and streets:* Severe—depth to rock, slope
- Roadfill:* Poor—depth to rock, slope
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Poor—depth to rock, small stones, slope
- Pond reservoir areas:* Severe—depth to rock, slope
- Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Robson Soil for Selected Uses**

- Range seeding:* Poor—droughty, erodes easily
- Daily cover for landfill:* Poor—depth to rock, large stones, slope
- Shallow excavations:* Severe—depth to rock, large stones, slope
- Local roads and streets:* Severe—depth to rock, large stones, slope
- Roadfill:* Poor—depth to rock, large stones, slope
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Topsoil:* Poor—depth to rock, small stones, slope
- Pond reservoir areas:* Severe—depth to rock, slope
- Embankments, dikes, and levees:* Severe—large stones, thin layer

**Ratings of the Bregar Soil for Selected Uses**

- Range seeding:* Poor—droughty, small stones, depth to rock
- Daily cover for landfill:* Poor—depth to rock, slope



*Shallow excavations:* Severe—depth to rock, slope  
*Local roads and streets:* Severe—depth to rock, slope  
*Roadfill:* Poor—depth to rock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to rock, small stones, slope  
*Pond reservoir areas:* Severe—depth to rock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Locane soil—VIIIs, nonirrigated;  
 Robson soil—VIIe, nonirrigated; Bregar soil—VIIIs,  
 nonirrigated  
*Range site:* Locane soil—024X035N; Robson soil—  
 024X018N; Bregar soil—024X016N

## **3561—Locane-Sumine-Glean association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,300 to 7,500 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 80 days

### **Composition**

#### *Major components:*

- Locane very gravelly loam, 30 to 50 percent slopes, eroded—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—35 percent
- Sumine gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—30 percent
- Glean gravelly silt loam, 30 to 50 percent slopes—Pachic Haploxerolls, loamy-skeletal, mixed, frigid—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Rock outcrop—8 percent
- Inclusion 2: Bregar extremely gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—4 percent
- Inclusion 3: Vanwyper gravelly silt loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—2 percent
- Inclusion 4: Cumulic Haploxerolls, 2 to 4 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, frigid—1 percent

### **Characteristics of the Locane Soil**

*Position on landscape:* West- and east-facing side slopes of mountains  
*Parent material:* Kind—residuum; source—silicious conglomerate  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Singleleaf pinyon, Utah

juniper, Wyoming big sagebrush, bluebunch wheatgrass

### **Typical Profile**

0 to 6 inches—very gravelly loam; 5 to 15 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
 6 to 14 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7  
 14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Hazard of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.4 to 1.9 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Sumine Soil**

*Position on landscape:* South-facing side slopes of mountains  
*Parent material:* Kind—colluvium over residuum; source—quartzite, breccia, and sandstone  
*Slope features:* Length—short; shape—plane to convex  
*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass

### **Typical Profile**

0 to 10 inches—gravelly loam; 25 to 50 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4  
 10 to 30 inches—very gravelly clay loam, very gravelly loam, very cobbly clay loam; 15 to 40 percent

cobbles and stones and 35 to 65 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

30 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.5 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Glean Soil**

*Position on landscape:* North-facing snow pockets and back slopes of mountains

*Parent material:* Kind—gravely colluvium over residuum; source—various kinds of rock

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Mountain big sagebrush, snowberry, lanceleaf rabbitbrush, Idaho fescue, bluegrass

### **Typical Profile**

0 to 6 inches—gravely silt loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM, ML; estimated AASHTO classification—A-4

6 to 49 inches—very gravelly loam, very gravelly sandy loam; 0 to 25 percent cobbles and stones and 40 to 75 percent pebbles (by weight); massive; soft, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

49 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.1 to 5.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Very rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—3; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered peaks

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* South-facing shoulders and upper side slopes of mountains

*Contrasting features:* Bedrock at a depth of less than 20 inches, lower water-supplying capacity

*Distinctive present vegetation:* Low sagebrush, black sagebrush, Idaho fescue

#### **Inclusion 3**

*Position on landscape:* North-facing, lower side slopes of mountains

*Contrasting features:* Moderately deep to hard bedrock, very gravelly clay subsoil

*Distinctive present vegetation:* Bluebunch wheatgrass, mountain big sagebrush

#### **Inclusion 4**

*Position on landscape:* Narrow drainageways of mountains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Woodland on the Locane soil:**

*Site index for common trees:* Singleleaf pinyon—22; Utah juniper—22

*Most important understory plants:* Wyoming big sagebrush, bluebunch wheatgrass

#### **Wildlife habitat elements:**

*Suitability of the Locane soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous

plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Sumine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Glean soil for named elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

#### **Ratings of the Locane Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—depth to rock, slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones, slope

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Sumine Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Glean Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope, seepage

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Locane soil—VII, nonirrigated; Sumine soil—VIIe, nonirrigated; Glean soil—VIIe, nonirrigated

*Range site:* Locane soil—025X062N; Sumine soil—024X029N; Glean soil—024X023N

*Woodland suitability group:* Locane soil—1R

### **3564—Locane-Zoesta-Bucan association**

#### **Map Unit Setting**

*Position on landscape:* Mountains and foothills

*Elevation:* 6,000 to 6,900 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 80 days

#### **Composition**

*Major components:*

- Locane very gravelly fine sandy loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—35 percent
  - Zoesta cobbly loam, 15 to 30 percent slopes—Xerollic Paleargids, fine, montmorillonitic, frigid—30 percent
  - Bucan cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—20 percent
- Contrasting inclusions:*
- Inclusion 1: Lithic Xerollic Haplargids, 4 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—8 percent
  - Inclusion 2: Aridic Argixerolls, 15 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—4 percent
  - Inclusion 3: Fluventic Haploxerolls, 4 to 15 percent slopes—Fluventic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent
  - Inclusion 4: Rock outcrop—1 percent

#### **Characteristics of the Locane Soil**

*Position on landscape:* Broad, lower side slopes of foothills and mountains

*Parent material:* Kind—residuum; source—interbedded shale and conglomerate

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

#### **Typical Profile**

0 to 6 inches—very gravelly fine sandy loam; 5 to 15 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

6 to 14 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—GC; estimated AASHTO

classification—A-2, A-6, A-7

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.4 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—

1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Zoesta Soil**

*Position on landscape:* Broad, north- and east-facing side slopes of foothills and mountains

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, downy rabbitbrush

### **Typical Profile**

0 to 7 inches—cobbly loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

7 to 23 inches—clay; 0 to 10 percent cobbles and stones and 5 to 15 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

23 to 31 inches—gravelly clay loam, gravelly clay; 30 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

31 to 60 inches—very gravelly clay loam, very gravelly loam; 55 to 70 percent pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified

classification—GC; estimated AASHTO

classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 7.9 to 9.1 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—

1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Bucan Soil**

*Position on landscape:* South-facing side slopes of foothills and mountains

*Parent material:* Kind—residuum capped with loess influenced by volcanic ash; source—volcanic rock

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Thurber needlegrass, Wyoming big sagebrush, bluebunch wheatgrass

### **Typical Profile**

0 to 5 inches—cobbly loam; 20 to 25 percent cobbles and stones and 20 to 30 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 30 inches—clay; 0 to 10 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; very hard, very firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH; estimated AASHTO classification—A-7

30 to 52 inches—clay loam, gravelly clay loam, gravelly clay; 10 to 30 percent cobbles and stones and 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-7

52 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Hazard of flooding:* None

*Permeability:* Slow

*Available water capacity:* 7.2 to 8.0 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—3; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex lower summits and north-facing shoulders of mountains and foothills

*Contrasting features:* Layer of lime accumulation in subsoil

*Distinctive present vegetation:* Black sagebrush, bluegrass

#### **Inclusion 2**

*Position on landscape:* Concave back slopes of mountains

*Contrasting features:* Very deep

*Distinctive present vegetation:* Wyoming big sagebrush, mountain big sagebrush, bluegrass, and bluebunch wheatgrass

#### **Inclusion 3**

*Position on landscape:* Concave drainageways of mountains and foothills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### **Inclusion 4**

*Position on landscape:* Scattered peaks of mountains and foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Locane soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Zoesta soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Bucan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Locane Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to rock, small stones, slope

*Shallow excavations:* Severe—depth to rock, slope

*Local roads and streets:* Severe—depth to rock, slope

*Roadfill:* Poor—depth to rock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to rock, small stones, slope

*Pond reservoir areas:* Severe—depth to rock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Zoesta Soil for Selected Uses**

*Range seeding:* Poor—rooting depth

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Fair—shrink-swell, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Slight

### **Ratings of the Bucan Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—low strength, shrink-swell, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, too clayey, area reclaim

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Locane soil—VIIIs, nonirrigated; Zoesta soil—VIs, nonirrigated; Bucan soil—VIIe, nonirrigated

*Range site:* Locane soil—024X005N; Zoesta soil—024X018N; Bucan soil—024X028N

## **3621—Minat-Bojo-Stingdorn association**

### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,400 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Minat very cobbly sandy loam, 30 to 50 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—35 percent
- Bojo extremely gravelly loam, 30 to 50 percent slopes—Lithic Haplargids, loamy, mixed, mesic—30 percent
- Stingdorn very gravelly loam, 30 to 50 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Rock outcrop—8 percent
- Inclusion 2: Rubble land—7 percent

### **Characteristics of the Minat Soil**

*Position on landscape:* Side slopes of foothills

*Parent material:* Kind—colluvium influenced by volcanic ash; source—cherts and shales

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, Thurber needlegrass, bluegrass

*Surface cover:* 45 percent pebbles, 25 percent cobbles

### **Typical Profile**

0 to 9 inches—very cobbly sandy loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2

9 to 27 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

27 to 60 inches or more—very gravelly fine sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 5.8 to 7.0 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Bojo Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, shadscale, bottlebrush squirreltail

### **Typical Profile**

0 to 4 inches—extremely gravelly loam; 10 to 25 percent cobbles and stones and 65 to 80 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 10 inches—gravelly clay loam, gravelly loam, clay loam; 0 to 10 percent cobbles and stones and 15 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6

10 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 5 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.2 to 1.4 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Stingdorn Soil**

*Position on landscape:* South-facing side slopes of foothills

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—GC; estimated AASHTO classification—A-6

15 to 20 inches—indurated duripan; massive

20 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 20 inches

*Depth to bedrock:* 8 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.3 to 1.8 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Cliffs on eroded side slopes and rimrock on shoulder slopes of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Side slopes of foothills below rock outcrop

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Minat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Bojo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### **Ratings of the Minat Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

### **Ratings of the Bojo Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Daily cover for landfill:* Severe—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Stingdorn Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, cemented pan

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Minat soil—VIIIs, nonirrigated; Bojo soil—VIIIs, nonirrigated; Stingdorn soil—VIIIs, nonirrigated

*Range site:* Minat soil—024X005N; Bojo soil—024X026N; Stingdorn soil—024X002N

## **3622—Minat-Minat, eroded, association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,200 to 5,800 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Minat very cobbly loam, 50 to 75 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—65 percent

- Minat very cobbly loam, 50 to 75 percent slopes, eroded—Xerollic Camborthids, loamy-skeletal, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—3 percent

- Inclusion 2: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—3 percent

- Inclusion 3: Settlemyer fine sandy loam, drained, 2 to 8 percent slopes—Fluvaquentic Haplaquolls, fine-loamy, mixed, mesic—3 percent

- Inclusion 4: Rubble land—6 percent

### **Characteristics of the Minat Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium influenced by volcanic ash; source—cherts and shales

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Douglas rabbitbrush, Thurber needlegrass, bluegrass

### **Typical Profile**

0 to 9 inches—very cobbly loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles

(by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, SM-SC, SC; estimated AASHTO classification—A-4, A-6, A-2

9 to 27 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

27 to 60 inches or more—very gravelly fine sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 5.8 to 7.0 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Minat, Eroded, Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—colluvium influenced by volcanic ash; source—cherts and shales

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bluebunch wheatgrass, Douglas rabbitbrush, Thurber needlegrass, bluegrass

### **Typical Profile**

0 to 4 inches—very cobbly loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, SM-SC, SC; estimated AASHTO classification—A-4, A-6, A-2



4 to 21 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

21 to 60 inches or more—very gravelly fine sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 5.8 to 7.0 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Rimrock on shoulder slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Concave inset fan remnants

*Contrasting features:* Slopes of 2 to 8 percent

*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

#### **Inclusion 3**

*Position on landscape:* Drainageways of mountains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### **Inclusion 4**

*Position on landscape:* Vertical rock stripes on side slopes of mountains below rock outcrop

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Minat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Minat, eroded, soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the Minat Soil for Selected Uses**

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—large stones

### **Ratings of the Minat, Eroded, Soil for Selected Uses**

*Range seeding:* Poor—large stones  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—large stones

### **Interpretive Groups**

*Capability classification:* Minat soil—VIIs, nonirrigated; Minat, eroded, soil—VIIs, nonirrigated

*Range site:* Minat soil—024X005N; Minat, eroded, soil—024X035N

## **3624—Minat-Colbar-Atlow association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,800 to 6,400 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Minat very cobbly loam, 30 to 50 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—50 percent
- Colbar cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—20 percent
- Atlow very cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—15 percent

#### *Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 4 to 15 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—4 percent
- Inclusion 2: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, fine-loamy, mixed, mesic—4 percent
- Inclusion 3: Rock outcrop—4 percent
- Inclusion 4: Rubble land—3 percent

### **Characteristics of the Minat Soil**

*Position on landscape:* West-, north-, and east-facing canyon escarpments on side slopes of mountains

*Parent material:* Kind—colluvium influenced by volcanic ash; source—cherts and shales

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming sagebrush, Douglas rabbitbrush, Thurber needlegrass, bluegrass

### **Typical Profile**

- 0 to 9 inches—very cobbly loam; 30 to 45 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, SM-SC, SC; estimated AASHTO classification—A-4, A-6, A-2
- 9 to 27 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2
- 27 to 60 inches or more—very gravelly fine sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—GM-GC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 5.8 to 7.0 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Colbar Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, Thurber needlegrass

### **Typical Profile**

- 0 to 3 inches—cobbly loam; 35 to 45 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
- 26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.3 to 3.8 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Atlow Soil**

*Position on landscape:* Crests and shoulder slopes of mountains  
*Parent material:* Kind—residuum influenced by loess; source—altered rhyolitic tuff  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, bluegrass, rabbitbrush

### **Typical Profile**

0 to 3 inches—very cobbly loam; 35 to 50 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4  
 3 to 14 inches—very gravelly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6  
 14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.1 to 1.3 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Narrow drainageways of mountains

*Contrasting features:* Slopes of 4 to 15 percent

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass, bluegrass

#### **Inclusion 2**

*Position on landscape:* Broad drainageways of mountains

*Contrasting features:* Slopes of 2 to 8 percent, receives additional moisture from runoff

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

#### **Inclusion 3**

*Position on landscape:* Rimrock on side slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 4**

*Position on landscape:* Vertical rock stripes on side slopes of mountains below rock outcrop

*Contrasting features:* More than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Minat soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Atlow soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Minat Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—small stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, area reclaim, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—large stones

**Ratings of the Colbar Soil for Selected Uses***Range seeding:* Fair—droughty, large stones, too arid*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones*Shallow excavations:* Severe—depth to bedrock, slope*Local roads and streets:* Severe—slope*Roadfill:* Poor—depth to bedrock, slope*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—slope, large stones*Pond reservoir areas:* Severe—seepage, slope*Embankments, dikes, and levees:* Moderate—large stones, piping**Ratings of the Atlow Soil for Selected Uses***Range seeding:* Poor—droughty, large stones*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope*Shallow excavations:* Severe—depth to bedrock, slope*Local roads and streets:* Severe—depth to bedrock, slope*Roadfill:* Poor—depth to bedrock, slope*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—depth to bedrock, small stones, slope*Pond reservoir areas:* Severe—depth to bedrock, slope*Embankments, dikes, and levees:* Severe—thin layer**Interpretive Groups***Capability classification:* Minat soil—VIIIs, nonirrigated; Colbar soil—VIIe, nonirrigated; Atlow soil—VIIIs, nonirrigated*Range site:* Minat soil—024X005N; Colbar soil—024X005N; Atlow soil—024X030N**3650—McVegas-Old Camp-Kingingham association****Map Unit Setting***Position on landscape:* Foothills and fan piedmonts*Elevation:* 5,200 to 5,800 feet*Average annual precipitation:* About 8 inches*Average annual air temperature:* About 48 degrees F*Frost-free season:* About 110 days**Composition***Major components:*

- McVegas very cobbly loam, 15 to 30 percent slopes—Haplic Nadurargids, clayey-skeletal, montmorillonitic, mesic, shallow—45 percent
- Old Camp very gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—25 percent

- Kingingham gravelly very fine sandy loam, 4 to 8 percent slopes—Typic Nadurargids, fine, montmorillonitic, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 15 to 30 percent slopes—Xeric Torriorthents, fine-loamy, mixed (calcareous), mesic—6 percent
- Inclusion 2: Xerollic Haplargids, 2 to 8 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—6 percent
- Inclusion 3: Rock outcrop—3 percent

**Characteristics of the McVegas Soil***Position on landscape:* South-facing side slopes of foothills*Parent material:* Kind—residuum; source—volcanic rock*Slope features:* Length—short; shape—convex*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail**Typical Profile**

0 to 5 inches—very cobbly loam; 35 to 45 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4

5 to 19 inches—very cobbly clay, very cobbly clay loam, very cobbly silty clay; 30 to 40 percent cobbles and stones and 25 to 35 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7

19 to 22 inches—strongly cemented duripan

22 inches—unweathered bedrock

**Soil and Water Features***Depth to hardpan:* 14 to 20 inches*Depth to bedrock:* 15 to 23 inches*Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* Slow*Available water capacity:* 2.5 to 2.9 inches*Water-supplying capacity:* 7 inches*Runoff:* Rapid*Hydrologic group:* D*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8*Hazard of erosion:* By water—slight; by wind—slight*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Old Camp Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, bluegrass

### **Typical Profile**

0 to 5 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 5 to 55 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2

5 to 11 inches—very gravelly clay loam; 5 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

11 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 0.9 to 1.3 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Kingingham Soil**

*Position on landscape:* Fan piedmonts at the base of foothills

*Parent material:* Gravelly mixed alluvium capped with a thin loess mantle

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, pine bluegrass

### **Typical Profile**

0 to 7 inches—gravelly very fine sandy loam; 0 to 5

percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

7 to 22 inches—gravelly clay loam, gravelly clay, gravelly silty clay loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 15 to 30); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7

22 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### **Soil and Water Features**

*Depth to hardpan:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 3.5 to 4.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.32; T value—2; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Eroded side slopes of foothills

*Contrasting features:* Lacks layer of clay accumulation

*Distinctive present vegetation:* Shadscale, Wyoming big sagebrush, bottlebrush squirreltail

#### **Inclusion 2**

*Position on landscape:* Inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Spiny hopsage, Wyoming big sagebrush, bottlebrush squirreltail

#### **Inclusion 3**

*Position on landscape:* Scattered peaks of foothills

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the McVegas soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Old Camp soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Kingingham soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings of the McVegas Soil for Selected Uses**

*Range seeding:* Poor—too arid, droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, large stones

*Shallow excavations:* Severe—depth to bedrock, slope, cemented pan

*Local roads and streets:* Severe—low strength, slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock, low strength, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, large stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope, too clayey

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Old Camp Soil for Selected Uses**

*Range seeding:* Poor—small stones, droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Kingingham Soil for Selected Uses**

*Range seeding:* Poor—too arid, rooting depth, excess salt

*Daily cover for landfill:* Poor—cemented pan, hard to pack

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—cemented pan, low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, too clayey

*Pond reservoir areas:* Severe—cemented pan, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* McVegas soil—VIIs, nonirrigated; Old Camp soil—VIIs, nonirrigated; Kingingham soil—VIIs, nonirrigated

*Range site:* McVegas soil—024X002N; Old Camp soil—024X005N; Kingingham soil—024X002N

**3651—McVegas-Beoska association****Map Unit Setting**

*Position on landscape:* Foothills and adjacent fan piedmonts

*Elevation:* 5,000 to 5,400 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition**

*Major components:*

- McVegas cobbly loam, 15 to 30 percent slopes—Haplic Nadurargids, clayey-skeletal, montmorillonitic, mesic, shallow—45 percent

- Beoska gravelly loam, 4 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—40 percent

*Contrasting inclusions:*

- Inclusion 1: Orovada fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—7 percent

- Inclusion 2: Old Camp gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—6 percent

- Inclusion 3: Puett very gravelly loam, 15 to 30 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—2 percent

**Characteristics of the McVegas Soil**

*Position on landscape:* Crests and side slopes of foothills

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

**Typical Profile**

0 to 5 inches—cobbly loam; 20 to 30 percent cobbles and stones and 20 to 30 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, GM, ML; estimated AASHTO classification—A-4

5 to 19 inches—very cobbly clay, very cobbly clay loam, very cobbly silty clay; 25 to 40 percent cobbles and

stones and 25 to 35 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7

19 to 22 inches—strongly cemented duripan

22 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 15 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.5 to 2.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Beoska Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-4

8 to 18 inches—silt loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

18 to 60 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic

(SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 7.9 to 9.8 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Concave inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

#### **Inclusion 2**

*Position on landscape:* Concave, north-facing side slopes of foothills

*Contrasting features:* Bedrock at a depth of 10 to 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

#### **Inclusion 3**

*Position on landscape:* Concave shoulders and erosion balloons of foothills

*Contrasting features:* Underlain by soft, semiconsolidated sediments

*Distinctive present vegetation:* Black sagebrush, Wyoming big sagebrush, bluegrass Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the McVegas soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### **Ratings of the McVegas Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, large stones

*Shallow excavations:* Severe—depth to bedrock, slope, cemented pan

*Local roads and streets:* Severe—low strength, slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock, low strength, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, cemented pan, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones, excess sodium

### **Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Fair—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, excess sodium

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Interpretive Groups**

*Capability classification:* McVegas soil—VIIIs, nonirrigated; Beoska soil—VIIIs, nonirrigated

*Range site:* McVegas soil—024X002N; Beoska soil—024X002N

## **3652—McVegas-Stingdorn-Colbar association**

### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,400 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- McVegas very cobbly loam, 15 to 30 percent slopes—Haplic Nadurargids, clayey-skeletal, montmorillonitic, mesic, shallow—35 percent
- Stingdorn extremely cobbly fine sandy loam, 30 to 50

percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—30 percent

- Colbar very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop and Rubble land—9 percent
- Inclusion 2: Xerollic Camborthids, 30 to 50 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—4 percent
- Inclusion 3: Durorthidic Xeric Torrifluvents, 8 to 15 percent slopes—Durorthidic Xeric Torrifluvents, loamy-skeletal, mixed (calcareous), mesic—2 percent

### **Characteristics of the McVegas Soil**

*Position on landscape:* Lower side slopes of foothills

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

*Surface cover:* 10 percent pebbles, 30 percent cobbles

### **Typical Profile**

0 to 5 inches—very cobbly loam; 35 to 45 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM; estimated AASHTO classification—A-4

5 to 19 inches—very cobbly clay, very cobbly clay loam, very cobbly silty clay; 25 to 40 percent cobbles and stones and 25 to 35 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL, CH, GC; estimated AASHTO classification—A-7

19 to 22 inches—strongly cemented duripan

22 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* 15 to 23 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.5 to 2.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8



*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Stingdorn Soil**

*Position on landscape:* South- and west-facing, upper side slopes of foothills

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### **Typical Profile**

0 to 7 inches—extremely cobbly fine sandy loam; 50 to 60 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-2, A-1

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC; estimated AASHTO classification—A-6

15 to 20 inches—indurated duripan; massive

20 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 8 to 20 inches

*Depth to bedrock:* 8 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.5 to 1.9 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Colbar Soil**

*Position on landscape:* North-facing, upper side slopes of foothills

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, Thurber needlegrass

### **Typical Profile**

0 to 3 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

3 to 22 inches—cobbly loam, gravelly clay loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 26 inches—gravelly loam, cobbly loam; 5 to 30 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

26 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 3.3 to 3.8 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Rimrock on shoulders and rock stripes on side slopes of foothills below rock outcrop

*Contrasting features:* Bedrock exposed at the soil surface or more than 90 percent stones on the surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Concave foot slopes of foothills

*Contrasting features:* Bedrock at a depth of more than 40 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Thurber needlegrass

### **Inclusion 3**

*Position on landscape:* Concave drainageways of foothills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the McVegas soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Colbar soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### **Ratings of the McVegas Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones, too arid

*Daily cover for landfill:* Large stones, depth to bedrock, hard to pack

*Shallow excavations:* Severe—depth to bedrock, slope, cemented pan

*Local roads and streets:* Severe—low strength, slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock, low strength, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, cemented pan, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones, excess sodium

### **Ratings of the Stingdorn Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones, too arid

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, cemented pan, large stones

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, cemented pan

*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Colbar Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, large stones

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—large stones

### **Interpretive Groups**

*Capability classification:* McVegas soil—VIIIs, nonirrigated; Stingdorn soil—VIIIs, nonirrigated; Colbar soil—VIIIs, nonirrigated

*Range site:* McVegas soil—024X002N; Stingdorn soil—024X002N; Colbar soil—024X005N

## **3661—Dun Glen-Whirlo association**

### **Map Unit Setting**

*Position on landscape:* Piedmont slopes

*Elevation:* 4,600 to 5,200 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Dun Glen very fine sandy loam, 0 to 4 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—60 percent
- Whirlo fine sandy loam, 0 to 4 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—25 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Haplargids, 0 to 4 percent slopes—Typic Haplargids, loamy-skeletal, mixed, mesic—8 percent
- Inclusion 2: Duric Camborthids, 0 to 4 percent slopes—Duric Camborthids, loamy-skeletal, mixed, mesic—7 percent

### **Characteristics of the Dun Glen Soil**

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium influenced by loess and volcanic ash

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, Indian ricegrass, bottlebrush squirreltail

#### **Typical Profile**

0 to 3 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML; estimated AASHTO classification—A-4

3 to 10 inches—very fine sandy loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 60 inches or more—fine sandy loam, very fine sandy loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—SM; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* 6.8 to 8.0 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### **Characteristics of the Whirlo Soil**

*Position on landscape:* Inset fans and fan skirt remnants

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Indian ricegrass

#### **Typical Profile**

0 to 12 inches—fine sandy loam; 15 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.1); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

12 to 24 inches—very gravelly fine sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

24 to 60 inches or more—stratified very gravelly loam to extremely gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 4.9 to 6.1 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Convex, nonburied fan piedmont remnants

*Contrasting features:* Layer of clay accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush

##### **Inclusion 2**

*Position on landscape:* Fan skirt remnants

*Contrasting features:* Layer of weak silica accumulation

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Dun Glen soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Whirlo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### **Ratings of the Dun Glen Soil for Selected Uses**

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—small stones  
*Pond reservoir areas:* Moderate—seepage, slope  
*Embankments, dikes, and levees:* Severe—piping

### **Ratings of the Whirlo Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt  
*Daily cover for landfill:* Poor—seepage, small stones  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—small stones, area reclaim, excess salt  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Dun Glen soil—Ile, irrigated, and VIIc, nonirrigated; Whirlo soil—Ile, irrigated, and VIIs, nonirrigated  
*Range site:* Dun Glen soil—024X002N; Whirlo soil—024X002N

## **3690—Izod-Koynik-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Foothills  
*Elevation:* 5,500 to 6,100 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### **Major components:**

- Izod cobbly loam, 15 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—40 percent
- Koynik very gravelly very fine sandy loam, 15 to 30 percent slopes—Lithic Torriorthents, loamy-skeletal, carbonatic, mesic—30 percent
- Rock outcrop—15 percent

#### **Contrasting inclusions:**

- Inclusion 1: Lithic Xerollic Haplargids, 8 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—5 percent

- Inclusion 2: Xerollic Camborthids, 15 to 30 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Xeric Torriorthents, 4 to 15 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

### **Characteristics of the Izod Soil**

*Position on landscape:* North- and east-facing side slopes of foothills  
*Parent material:* Kind—residuum; source—interbedded shale and limestone  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, small rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 4 inches—cobbly loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, CL-ML, ML; estimated AASHTO classification—A-4  
 4 to 10 inches—very gravelly loam, extremely gravelly loam; 0 to 25 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2  
 10 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 7 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 0.4 to 0.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Koynik Soil**

*Position on landscape:* South-facing side slopes of foothills  
*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, bluegrass

### Typical Profile

- 0 to 6 inches—very gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, GM-GC, GM; estimated AASHTO classification—A-1, A-2
- 6 to 8 inches—very gravelly loam, very gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC, GC, SC; estimated AASHTO classification—A-2
- 8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 8 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 0.6 to 0.7 inches  
*Water-supplying capacity:* 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Rock Outcrop

*Position on landscape:* Multiple ledges and locally exposed bedrock along broad bedding planes  
*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex summits of foothills  
*Contrasting features:* Slopes of 8 to 15 percent  
*Distinctive present vegetation:* Black sagebrush, bluegrass

#### Inclusion 2

*Position on landscape:* Concave, north-facing side slopes of foothills

*Contrasting features:* Bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass, Thurber needlegrass

### Inclusion 3

*Position on landscape:* Concave drainageways of foothills

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Spiny hopsage, Wyoming big sagebrush, bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Izod soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Koynik soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### Ratings of the Izod Soil for Selected Uses

*Range seeding:* Poor—droughty, erodes easily, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Koynik Soil for Selected Uses

*Range seeding:* Poor—too arid, droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Izod soil—VIIIs, nonirrigated;

Koynik soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Izod soil—024X030N; Koynik soil—024X002N

**3691—Izod-Rock outcrop association****Map Unit Setting***Position on landscape:* Mountains*Elevation:* 5,500 to 6,100 feet*Average annual precipitation:* About 9 inches*Average annual air temperature:* About 48 degrees F*Frost-free season:* About 100 days**Composition***Major components:*

- Izod extremely cobbly loam, 15 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—65 percent

- Rock outcrop—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 4 to 15 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—7 percent

- Inclusion 2: Durorthidic Xeric Torriorthents, 2 to 8 percent slopes—Durorthidic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

- Inclusion 3: Kram very stony loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—3 percent

**Characteristics of the Izod Soil***Position on landscape:* Side slopes of mountains*Parent material:* Kind—residuum; source—interbedded shale and limestone*Slope features:* Length—short; shape—concave to convex*Dominant present vegetation:* Black sagebrush, small rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail*Surface cover:* 30 percent pebbles, 25 percent cobbles, 5 percent stones**Typical Profile**

0 to 4 inches—extremely cobbly loam; 40 to 50 percent cobbles and stones and 60 to 75 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, GM-GC, GC; estimated AASHTO classification—A-2

4 to 10 inches—very gravelly loam, extremely gravelly loam; 0 to 25 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2

10 inches—unweathered bedrock

**Soil and Water Features***Depth to bedrock:* 7 to 14 inches*Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* Moderate*Available water capacity:* 0.4 to 0.5 inches*Water-supplying capacity:* 7 inches*Runoff:* Rapid*Hydrologic group:* D*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8*Hazard of erosion:* By water—slight; by wind—slight*Shrink-swell potential:* Low*Corrosivity:* To steel—high; to concrete—low*Potential frost action:* Moderate**Characteristics of the Rock Outcrop***Position on landscape:* Scattered peaks and rimrock on shoulder slopes of mountains*Dominant present vegetation:* None**Contrasting Inclusions****Inclusion 1***Position on landscape:* Concave toe slopes of mountains*Contrasting features:* Bedrock at a depth of more than 20 inches*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass, bluegrass**Inclusion 2***Position on landscape:* Drainageways of mountains*Contrasting features:* Receives additional moisture from runoff*Distinctive present vegetation:* Basin wildrye, basin big sagebrush**Inclusion 3***Position on landscape:* Concave side slopes of mountains*Contrasting features:* Highly calcareous throughout the profile*Distinctive present vegetation:* Black sagebrush, Utah juniper, singleleaf pinyon**Ratings of the Izod Soil for Selected Uses***Range seeding:* Poor—droughty, large stones, depth to bedrock*Daily cover for landfill:* Poor—depth to bedrock, slope*Shallow excavations:* Severe—depth to bedrock, slope*Local roads and streets:* Severe—depth to bedrock, slope*Roadfill:* Poor—depth to bedrock, slope*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Izod soil—VIIIs, nonirrigated;  
 Rock outcrop—VIIIIs  
*Range site:* Izod soil—024X030N

## **3693—Izod-Attella-Xine association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,500 to 7,000 feet  
*Average annual precipitation:* About 11 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 90 days

### **Composition**

#### **Major components:**

- Izod cobbly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—40 percent
  - Attella very gravelly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), frigid—30 percent
  - Xine gravelly loam, 30 to 50 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—15 percent
- Contrasting inclusions:*
- Inclusion 1: Aridic Argixerolls, 15 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—5 percent
  - Inclusion 2: Lithic Xeric Torriorthents, 8 to 30 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
  - Inclusion 3: Cumulic Haploxerolls, 2 to 8 percent slopes—Cumulic Haploxerolls, coarse-loamy, mixed, frigid—3 percent
  - Inclusion 4: Rock outcrop—2 percent

### **Characteristics of the Izod Soil**

*Position on landscape:* South-facing side slopes of mountains  
*Parent material:* Kind—residuum; source—interbedded shale and limestone  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Black sagebrush, small rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 4 inches—cobbly loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by

weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, CL-ML, ML; estimated AASHTO classification—A-4

4 to 10 inches—very gravelly loam, extremely gravelly loam; 0 to 25 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2

10 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 7 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 0.4 to 0.5 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Attella Soil**

*Position on landscape:* North-facing side slopes of mountains  
*Parent material:* Kind—colluvium over residuum; source—dolomite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Singleleaf pinyon, Wyoming big sagebrush, bluegrass, Utah juniper

### **Typical Profile**

0 to 3 inches—very gravelly loam; 5 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very gravelly loam, very gravelly silt loam; 5 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—GC, GM-GC; estimated AASHTO

classification—A-2

7 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 0.7 to 1.0 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Xine Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—shale

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Idaho fescue, bluebunch wheatgrass

### **Typical Profile**

0 to 10 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

10 to 33 inches—very cobbly loam, very cobbly sandy loam; 35 to 50 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2, A-4

33 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.5 to 4.2 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower, north-facing side slopes of mountains

*Contrasting features:* Layer of clay accumulation

*Distinctive present vegetation:* Mountain big sagebrush, serviceberry, Idaho fescue

#### **Inclusion 2**

*Position on landscape:* Convex shoulder slopes of mountains

*Contrasting features:* Bedrock at a depth of 11 to 20 inches

*Distinctive present vegetation:* Black sagebrush, bluegrass

#### **Inclusion 3**

*Position on landscape:* Drainageways of mountains

*Contrasting features:* Receives additional moisture from runoff, slopes of 2 to 8 percent

*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

#### **Inclusion 4**

*Position on landscape:* Scattered peaks and severely eroded side slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Woodland on the Attella soil:**

*Site index for common trees:* Singleleaf pinyon—40; Utah juniper—40

*Most important native understory plants:* Mountain big sagebrush, bluegrass

#### **Wildlife habitat elements:**

*Suitability of the Izod soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Attella soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Xine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair



**Ratings of the Izod Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Attella Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, slope, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Xine Soil for Selected Uses**

*Range seeding:* Fair—erodes easily, too arid

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, small stones

*Pond reservoir areas:* Severe—slope, seepage

*Embankments, dikes, and levees:* Severe—large stones

**Interpretive Groups**

*Capability classification:* Izod soil—VII, nonirrigated; Attella soil—VII, nonirrigated; Xine soil—VII, nonirrigated

*Range site:* Izod soil—024X030N; Attella soil—025X062N; Xine soil—024X021N

*Woodland suitability group:* Attella soil—1R

**3740—Kelk silt loam, saline, 0 to 4 percent slopes****Map Unit Setting**

*Position on landscape:* Inset fans

*Elevation:* 4,800 to 5,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

**Composition****Major components:**

- Kelk silt loam, saline, 0 to 4 percent slopes—Durixerollic Camborthids, fine-silty, mixed, mesic—85 percent

**Contrasting inclusions:**

- Inclusion 1: Kelk very fine sandy loam, 0 to 4 percent slopes, occasionally flooded—Durixerollic Camborthids, fine-silty, mixed, mesic—7 percent
- Inclusion 2: Broyles very fine sandy loam, 0 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Durorthidic Torriorthents, 0 to 4 percent slopes—Durorthidic Torriorthents, coarse-silty, mixed (calcareous), mesic—3 percent

**Characteristics of the Kelk Soil**

*Position on landscape:* Inset fan remnants

*Parent material:* Silty mixed alluvium and loess

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Rubber rabbitbrush, basin wildrye, black greasewood, basin big sagebrush

**Typical Profile**

0 to 3 inches—silt loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

3 to 18 inches—silt loam; subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR 5 to 13); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

18 to 42 inches—silt loam; massive; hard, firm; moderately alkaline (pH 8.4); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 25); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

42 to 60 inches or more—silt loam; massive; soft, very friable; moderately alkaline (pH 8.2); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

**Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 10 to 12 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—moderate  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

#### **Inclusion 2**

*Position on landscape:* Adjacent fan skirts  
*Contrasting features:* Fine sandy loam throughout the profile  
*Distinctive present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

#### **Inclusion 3**

*Position on landscape:* Adjacent foot slopes to the inset fans  
*Contrasting features:* Strongly salt-affected substratum  
*Distinctive present vegetation:* Big saltbush, black greasewood, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Kelk Soil for Selected Uses**

*Range seeding:* Poor—excess salt  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—low strength, frost action, shrink-swell  
*Roadfill:* Fair—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—thin layer  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* IIe, irrigated, and VIs, nonirrigated  
*Range site:* 024X022N

## **3741—Kelk-Settlemyer association**

### **Map Unit Setting**

*Position on landscape:* Inset fans  
*Elevation:* 4,900 to 6,000 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Kelk very fine sandy loam, 0 to 4 percent slopes, occasionally flooded—Durixerollic Camborthids, fine-silty, mixed, mesic—55 percent
- Settlemyer fine sandy loam, drained, 0 to 4 percent slopes—Fluvaquentic Haplaquolls, fine-loamy, mixed, mesic—30 percent

#### *Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 0 to 4 percent slopes—Xerollic Camborthids, fine-loamy, mixed, mesic—10 percent
- Inclusion 2: Duric Camborthids, 0 to 4 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—3 percent
- Inclusion 3: Aeric Fluvaquents, 0 to 4 percent slopes—Aeric Fluvaquents, loamy-skeletal, mixed (calcareous), mesic—2 percent

### **Characteristics of the Kelk Soil**

*Position on landscape:* Lower inset fans  
*Parent material:* Silty mixed alluvium and loess  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye, black greasewood

### **Typical Profile**

0 to 14 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6  
 14 to 51 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6  
 51 to 60 inches or more—silt loam; 0 to 10 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—brief or long; months—February through June  
*Permeability:* Slow  
*Available water capacity:* 11.2 to 12.5 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Very slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Settlemyer Soil

*Position on landscape:* Dissected inset fans on upper part of unit  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye

### Typical Profile

0 to 16 inches—fine sandy loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-4  
 16 to 40 inches—silt loam, silty clay loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
 40 to 60 inches or more—fine sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* December through March—36 to 48 inches; rest of year—below 48 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately slow  
*Available water capacity:* 9.4 to 11.0 inches  
*Water-supplying capacity:* 12 inches  
*Runoff:* Slow  
*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Lower inset fan remnants  
*Contrasting features:* Strongly salt-affected substratum  
*Distinctive present vegetation:* Big saltbush, black greasewood

#### Inclusion 2

*Position on landscape:* Fanettes from adjacent fan piedmont remnants  
*Contrasting features:* Nonflooded  
*Distinctive present vegetation:* Shadscale, black greasewood, spiny hopsage

#### Inclusion 3

*Position on landscape:* Areas adjacent to irregularly shaped channels of inset fans  
*Contrasting features:* Frequently flooded  
*Distinctive present vegetation:* Saltcedar, willow, rose

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Kelk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Settlemyer soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### Ratings of the Kelk Soil for Selected Uses

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Moderate—flooding  
*Local roads and streets:* Severe—low strength, flooding  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Good  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping

#### Ratings of the Settlemyer Soil for Selected Uses

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Fair—too clayey, wetness  
*Shallow excavations:* Moderate—wetness  
*Local roads and streets:* Severe—frost action, low strength  
*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Moderate—wetness

### **Interpretive Groups**

*Capability classification:* Kelk soil—IIw, irrigated, and VIw, nonirrigated; Settlemyer soil—IIw, irrigated, and VIw, nonirrigated

*Range site:* Kelk soil—024X006N; Settlemyer soil—025X003N

## **3742—Kelk-Ocala association**

### **Map Unit Setting**

*Position on landscape:* Alluvial flats

*Elevation:* 4,600 to 4,800 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Kelk very fine sandy loam, 0 to 2 percent slopes, occasionally flooded—Durixerollic Camborthids, fine-silty, mixed, mesic—55 percent

- Ocala silt loam, 0 to 2 percent slopes, occasionally flooded—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—30 percent

*Contrasting inclusions:*

- Inclusion 1: Durorthidic Torriorthents, 0 to 4 percent slopes—Durorthidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 2: Aeric Halaquepts, 0 to 2 percent slopes—Aeric Halaquepts, fine-loamy, mixed (calcareous), mesic—5 percent

- Inclusion 3: Aquic Torriorthents, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

### **Characteristics of the Kelk Soil**

*Position on landscape:* Broad inset fans dissecting alluvial flats

*Parent material:* Silty mixed alluvium and loess

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye, black greasewood

### **Typical Profile**

0 to 14 inches—very fine sandy loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than

4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

14 to 51 inches—silt loam; 0 to 5 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

51 to 60 inches or more—silt loam; 0 to 10 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through June

*Permeability:* In the upper 42 inches—slow; below this depth—moderate

*Available water capacity:* 11.3 to 12.5 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Ocala Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Mixed alluvium influenced by volcanic ash

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, seepweed, rabbitbrush

### **Typical Profile**

0 to 13 inches—silt loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.2); strongly saline (more than 16 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML, CL; estimated AASHTO classification—A-4, A-6

13 to 60 inches or more—silt loam, silty clay loam; massive; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 20 to 35); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to seasonal high water table:* February through May—42 to 60 inches; rest of year—below 60 inches

*Flooding:* Frequency—occasional; duration—brief or long; months—February through May

*Permeability:* Slow

*Available water capacity:* 11.4 to 12.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave, alluvial flat remnants

*Contrasting features:* Calcareous throughout and well drained

*Distinctive present vegetation:* Shadscale, black greasewood, Indian ricegrass

#### Inclusion 2

*Position on landscape:* Pondered areas associated with coppice mounds

*Contrasting features:* Poorly drained

*Distinctive present vegetation:* Black greasewood, seepweed

#### Inclusion 3

*Position on landscape:* Fan skirts overplacing alluvial flats

*Contrasting features:* Somewhat poorly drained

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Kelk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Ocala soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

#### Ratings of the Kelk Soil for Selected Uses

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—low strength, flooding

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Good

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—piping

#### Ratings of the Ocala Soil for Selected Uses

*Range seeding:* Poor—excess salt, excess sodium

*Daily cover for landfill:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—wetness, flooding

*Local roads and streets:* Severe—low strength, frost action, flooding

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—excess salt, excess sodium

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Interpretive Groups

*Capability classification:* Kelk soil—IIw, irrigated, and VIw, nonirrigated; Ocala soil—VIIw, nonirrigated

*Range site:* Kelk soil—024X006N; Ocala soil—024X007N

## 3840—Jung-Norfolk-Buffaran association

### Map Unit Setting

*Position on landscape:* Foothills

*Elevation:* 5,500 to 6,400 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 100 days

### Composition

*Major components:*

- Jung very gravelly loam, 8 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—35 percent

- Norfolk gravelly loam, 15 to 30 percent slopes—Xerollic Durargids, clayey, montmorillonitic, mesic, shallow—25 percent

- Buffaran gravelly loam, 4 to 8 percent slopes, very stony—Xerollic Durargids, clayey, montmorillonitic, mesic, shallow—25 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Xeric Torriorthents, 15 to 30 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—6 percent

- Inclusion 2: Durixerollic Haplargids, 2 to 8 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—6 percent

- Inclusion 3: Rock outcrop—3 percent

### **Characteristics of the Jung Soil**

*Position on landscape:* Crests and shoulder slopes of foothills

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail

#### **Typical Profile**

0 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

8 to 19 inches—very cobbly clay, very gravelly clay loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; very hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Norfolk Soil**

*Position on landscape:* North-facing side slopes of foothills

*Parent material:* Kind—residuum influenced by loess; source—metavolcanic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, bluegrass, bottlebrush squirreltail, small rabbitbrush

*Surface cover:* 25 percent pebbles, 5 percent cobbles

#### **Typical Profile**

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles

and stones and 30 to 45 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6

3 to 14 inches—gravelly silty clay, gravelly silty clay loam; 30 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, ML, MH; estimated AASHTO classification—A-7

14 to 17 inches—gravelly loam; 25 to 50 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, SM-SC, SC; estimated AASHTO classification—A-4, A-6

17 to 22 inches—indurated duripan; massive; extremely hard, extremely firm

22 inches or more—unweathered bedrock

#### **Soil and Water Features**

*Depth to hardpan:* 10 to 20 inches

*Depth to bedrock:* 21 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Buffaran Soil**

*Position on landscape:* Summits of interhill fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, bottlebrush squirreltail

#### **Typical Profile**

0 to 4 inches—gravelly loam; 5 to 15 percent cobbles and stones and 20 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—SC, CL; estimated AASHTO classification—A-6

- 4 to 15 inches—gravelly clay loam, gravelly clay, clay; 0 to 5 percent cobbles and stones and 15 to 30 percent pebbles (by weight); prismatic structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
- 15 to 60 inches or more—indurated duripan; massive; extremely hard, extremely firm

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.6 to 2.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Severely eroded, convex side slopes of foothills  
*Contrasting features:* Bedrock at a depth of 8 to 14 inches  
*Distinctive present vegetation:* Black sagebrush, bluegrass

#### Inclusion 2

*Position on landscape:* Inset fans  
*Contrasting features:* Very deep  
*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### Inclusion 3

*Position on landscape:* Scattered peaks of foothills  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Wildlife habitat elements:

*Suitability of the Jung soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Norfolk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Buffaran soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Jung Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones  
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, too clayey  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Moderate—hard to pack, large stones

### Ratings of the Norfolk Soil for Selected Uses

*Range seeding:* Poor—erodes easily, droughty  
*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, slope  
*Shallow excavations:* Severe—depth to bedrock, slope, cemented pan  
*Local roads and streets:* Severe—shrink-swell, slope, cemented pan  
*Roadfill:* Poor—depth to bedrock, shrink-swell, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—cemented pan, too clayey, small stones  
*Pond reservoir areas:* Severe—cemented pan, slope  
*Embankments, dikes, and levees:* Severe—hard to pack

### Ratings of the Buffaran Soil for Selected Uses

*Range seeding:* Poor—droughty  
*Daily cover for landfill:* Poor—cemented pan, hard to pack  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan, low strength  
*Roadfill:* Poor—low strength, cemented pan  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—cemented pan, small stones  
*Pond reservoir areas:* Severe—cemented pan  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Jung soil—VIIs, nonirrigated;

Norfork soil—VIIe, nonirrigated; Buffaran soil—VIIs, nonirrigated

*Range site:* Jung soil—024X030N; Norfork soil—024X030N; Buffaran soil—024X005N

### **3841—Jung-Itca-Roca association**

#### ***Map Unit Setting***

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,800 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 90 days

#### ***Composition***

*Major components:*

- Jung very cobbly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—35 percent
  - Itca very cobbly loam, 15 to 30 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—25 percent
  - Roca very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—25 percent
- Contrasting inclusions:*
- Inclusion 1: Lithic Xerollic Haplargids, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, mixed, mesic—9 percent
  - Inclusion 2: Durixerollic Haplargids, 4 to 15 percent slopes—Durixerollic Haplargids, fine-loamy, mixed, mesic—3 percent
  - Inclusion 3: Rock outcrop—3 percent

#### ***Characteristics of the Jung Soil***

*Position on landscape:* South- and west-facing, lower side slopes of crests and mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail

#### ***Typical Profile***

0 to 8 inches—very cobbly loam; 35 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

8 to 19 inches—very cobbly clay loam, very gravelly clay loam, very cobbly clay; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; very hard,

firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

#### ***Soil and Water Features***

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### ***Characteristics of the Itca Soil***

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, bluebunch wheatgrass, bluegrass, Utah juniper

#### ***Typical Profile***

0 to 9 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6

9 to 17 inches—very gravelly clay, very cobbly clay loam, extremely gravelly clay; 0 to 55 percent cobbles and stones and 25 to 70 percent pebbles (by weight); prismatic structure; hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, GC; estimated AASHTO classification—A-7, A-2

17 inches—unweathered bedrock

#### ***Soil and Water Features***

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None



*Permeability:* Slow

*Available water capacity:* 1.8 to 2.3 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Roca Soil**

*Position on landscape:* Upper, south-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex to slightly concave

*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, needlegrass, bluegrass

### **Typical Profile**

0 to 5 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 27 inches—very gravelly clay loam, very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

27 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.9 to 3.6 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower side slopes of mountains

*Contrasting features:* Mixed mineralogy clay

*Distinctive present vegetation:* Mountain and Wyoming big sagebrush, needlegrass, bluegrass

#### **Inclusion 2**

*Position on landscape:* Slightly concave toe slopes of mountains

*Contrasting features:* Very deep

*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

#### **Inclusion 3**

*Position on landscape:* Random small peaks and ridges of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Woodland on the Itca soil:**

*Site index for common trees:* Singleleaf pinyon—70

*Most important native understory plants:* Mountain big sagebrush, bluebunch wheatgrass, bluegrass

#### **Wildlife habitat elements:**

*Suitability of the Jung soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Itca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Roca soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Jung Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Itca Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, too clayey, small stones

*Shallow excavations:* Severe—depth to bedrock, slope, large stones

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, too clayey

*Pond reservoir areas:* Severe—slope, depth to bedrock

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Roca Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Jung soil—VIIs, nonirrigated; Itca soil—VIIs, nonirrigated; Roca soil—VIIs, nonirrigated

*Range site:* Jung soil—024X028N; Itca soil—025X061N; Roca soil—024B028N

*Woodland suitability group:* Itca soil—2X

## **3843—Jung, steep-Robson-Jung association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 90 days

### **Composition**

*Major components:*

- Jung very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—35 percent
- Robson cobbly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—30 percent

- Jung very gravelly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 15 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—6 percent
- Inclusion 2: Typic Natrargids, 15 to 50 percent slopes—Typic Natrargids, fine, montmorillonitic, mesic—4 percent
- Inclusion 3: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—3 percent
- Inclusion 4: Rock outcrop—2 percent

### **Characteristics of the Jung, Steep, Soil**

*Position on landscape:* East-, west-, and lower north-facing side slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

8 to 19 inches—very cobbly clay, very gravelly clay loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; very hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Robson Soil**

*Position on landscape:* North-facing, upper side slopes of mountains

*Parent material:* Kind—residuum; source—chert and shale

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, small rabbitbrush, black sagebrush

### **Typical Profile**

0 to 7 inches—cobbly loam; 15 to 45 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SC, CL-ML, CL; estimated AASHTO classification—A-4, A-6

7 to 19 inches—very cobbly clay, extremely cobbly clay; 50 to 80 percent cobbles and stones and 35 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 12 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 0.9 to 1.9 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Low

### **Characteristics of the Jung Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail

### **Typical Profile**

0 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

8 to 19 inches—very cobbly clay, very gravelly clay loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; very hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* South-facing back slopes of mountains

*Contrasting features:* Bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass, needlegrass

#### **Inclusion 2**

*Position on landscape:* South-facing, convex foot slopes of mountains

*Contrasting features:* Bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Shadscale, bud sagebrush

#### **Inclusion 3**

*Position on landscape:* Mountain valley fans

*Contrasting features:* Very deep

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### **Inclusion 4**

*Position on landscape:* Random small peaks and ridges of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Jung, steep, soil for named elements:*

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Robson soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Jung soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Jung, Steep, Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Robson Soil for Selected Uses**

*Range seeding:* Poor—droughty, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—large stones, excess fines

*Gravel:* Improbable source—large stones, excess fines

*Topsoil:* Poor—depth to bedrock, small stones, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—large stones

#### **Ratings of the Jung Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, too clayey

*Pond reservoir areas:* Severe—depth to bedrock

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Jung, steep, soil—VIIIs, nonirrigated; Robson soil—VIIe, nonirrigated; Jung soil—VIIIs, nonirrigated

*Range site:* Jung, steep, soil—024X030N; Robson soil—024X018N; Jung soil—024X030N

## **3845—Jung-Stingdorn-Atlow association**

### **Map Unit Setting**

*Position on landscape:* Foothills

*Elevation:* 5,100 to 6,100 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Jung very gravelly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—30 percent
  - Stingdorn extremely cobbly loam, 30 to 50 percent slopes—Typic Durargids, loamy-skeletal, mixed, mesic, shallow—30 percent
  - Atlow very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—25 percent
- Contrasting inclusions:*
- Inclusion 1: Xerollic Haplargids, 15 to 30 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow—5 percent
  - Inclusion 2: Haplic Nadurargids, 4 to 30 percent slopes—Haplic Nadurargids, clayey-skeletal, montmorillonitic, mesic, shallow—4 percent
  - Inclusion 3: Rock outcrop—3 percent
  - Inclusion 4: Rubble land—3 percent

### **Characteristics of the Jung Soil**

*Position on landscape:* Crests and shoulder slopes of foothills

*Parent material:* Kind—residuum; source—altered tuffs

*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail

### Typical Profile

0 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
 8 to 19 inches—very cobbly clay, very gravelly clay loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; very hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7  
 19 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.9 to 2.4 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Stingdorn Soil

*Position on landscape:* South- and west-facing side slopes of foothills  
*Parent material:* Kind—residuum; source—rhyolitic tuff  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 7 inches—extremely cobbly loam; 50 to 60 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-2, A-1

7 to 15 inches—very cobbly clay loam; 30 to 50 percent cobbles and stones and 35 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GC; estimated AASHTO classification—A-6  
 15 to 20 inches—indurated duripan; massive  
 20 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 8 to 20 inches  
*Depth to bedrock:* 8 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.5 to 1.9 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Atlow Soil

*Position on landscape:* North- and east-facing side slopes of foothills  
*Parent material:* Kind—residuum; source—altered tuff  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Black sagebrush, bluegrass

### Typical Profile

0 to 3 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6  
 3 to 14 inches—very gravelly clay loam, very cobbly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7  
 14 inches—unweathered bedrock

**Soil and Water Features***Depth to bedrock:* 14 to 20 inches*Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* None*Permeability:* Moderately slow*Available water capacity:* 1.1 to 1.3 inches*Water-supplying capacity:* 8 inches*Runoff:* Rapid*Hydrologic group:* D*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7*Hazard of erosion:* By water—moderate; by wind—slight*Shrink-swell potential:* Low*Corrosivity:* To steel—high; to concrete—low*Potential frost action:* Moderate**Contrasting Inclusions****Inclusion 1***Position on landscape:* Slightly concave, east-facing, lower side slopes of foothills*Contrasting features:* Very deep*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass**Inclusion 2***Position on landscape:* Convex lower side slopes of foothills*Contrasting features:* Sodium-affected subsoil*Distinctive present vegetation:* Shadscale, bud sagebrush**Inclusion 3***Position on landscape:* Random small peaks and ridges of foothills*Contrasting features:* Bedrock exposed at the soil surface*Distinctive present vegetation:* Barren**Inclusion 4***Position on landscape:* Rock stripes on side slopes of foothills below rock outcrop*Contrasting features:* More than 90 percent stones on the surface*Distinctive present vegetation:* Barren**Major Uses****Current uses:** Rangeland, wildlife habitat**Wildlife habitat elements:***Suitability of the Jung soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair*Suitability of the Stingdorn soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor*Suitability of the Atlow soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair**Ratings of the Jung Soil for Selected Uses***Range seeding:* Poor—droughty, small stones*Daily cover for landfill:* Poor—depth to bedrock, small stones*Shallow excavations:* Severe—depth to bedrock*Local roads and streets:* Severe—depth to bedrock*Roadfill:* Poor—depth to bedrock*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—depth to bedrock, small stones, too clayey*Pond reservoir areas:* Severe—depth to bedrock*Embankments, dikes, and levees:* Severe—thin layer**Ratings of the Stingdorn Soil for Selected Uses***Range seeding:* Poor—too arid, droughty, large stones*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope*Shallow excavations:* Severe—depth to bedrock, cemented pan, large stones*Local roads and streets:* Severe—depth to bedrock, large stones, slope*Roadfill:* Poor—depth to bedrock, large stones, slope*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—depth to bedrock, small stones, cemented pan*Pond reservoir areas:* Severe—depth to bedrock, cemented pan, slope*Embankments, dikes, and levees:* Severe—large stones**Ratings of the Atlow Soil for Selected Uses***Range seeding:* Poor—droughty, small stones*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope*Shallow excavations:* Severe—depth to bedrock, slope*Local roads and streets:* Severe—depth to bedrock, slope*Roadfill:* Poor—depth to bedrock, slope*Sand:* Improbable source—excess fines*Gravel:* Improbable source—excess fines*Topsoil:* Poor—depth to bedrock, small stones, slope*Pond reservoir areas:* Severe—depth to bedrock, slope*Embankments, dikes, and levees:* Severe—thin layer**Interpretive Groups***Capability classification:* Jung soil—VIIs, nonirrigated; Stingdorn soil—VIIs, nonirrigated; Atlow soil—VIIs, nonirrigated*Range site:* Jung soil—024X030N; Stingdorn soil—024X002N; Atlow soil—024X030N

### 3846—Jung-Wiskan association

#### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,300 to 7,000 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 80 days

#### Composition

*Major components:*

- Jung very gravelly loam, 15 to 50 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—55 percent
- Wiskan very gravelly silt loam, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—30 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, 15 to 30 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 2: Havingdon gravelly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent
- Inclusion 3: Rock outcrop—3 percent
- Inclusion 4: Cumulic Haploxerolls, 15 to 30 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, mesic—2 percent

#### Characteristics of the Jung Soil

*Position on landscape:* West- and east-facing side slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail

#### Typical Profile

0 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

8 to 19 inches—very cobbly clay, very gravelly clay loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; very hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7

19 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 1.9 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Low

#### Characteristics of the Wiskan Soil

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—thin loess mantle over residuum and colluvium; source—various kinds of rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, bluebunch wheatgrass, needlegrass, bluegrass

#### Typical Profile

0 to 16 inches—very gravelly silt loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); granular structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

16 to 28 inches—very gravelly clay loam, very gravelly loam, extremely gravelly clay loam; 10 to 25 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

28 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.4 to 3.0 inches

*Water-supplying capacity:* 10 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* South-facing, lower side slopes of mountains

*Contrasting features:* Deep

*Distinctive present vegetation:* Wyoming big sagebrush, needlegrass

#### **Inclusion 2**

*Position on landscape:* South-facing, upper side slopes of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Big sagebrush, needlegrass, bluebunch wheatgrass

#### **Inclusion 3**

*Position on landscape:* Scattered peaks of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 4**

*Position on landscape:* Drainageways of mountains

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Jung soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Wiskan soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

#### **Ratings of the Jung Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Wiskan Soil for Selected Uses**

*Range seeding:* Poor—small stones

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Jung soil—VIIIs, nonirrigated; Wiskan soil—VIIIs, nonirrigated

*Range site:* Jung soil—024X030N; Wiskan soil—024X031N

## **3881—Layview-Packer-Hapgood association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 8,000 to 10,000 feet

*Average annual precipitation:* About 16 inches

*Average annual air temperature:* About 41 degrees F

*Frost-free season:* About 45 days

### **Composition**

*Major components:*

- Layview extremely cobbly loam, 4 to 15 percent slopes—Argic Lithic Cryoborolls, loamy-skeletal, mixed—40 percent
  - Packer gravelly loam, 15 to 30 percent slopes—Argic Cryoborolls, loamy-skeletal, mixed—30 percent
  - Hapgood gravelly loam, 15 to 30 percent slopes—Pachic Cryoborolls, loamy-skeletal, mixed—15 percent
- Contrasting inclusions:*

- Inclusion 1: Packer extremely stony loam, 8 to 15 percent slopes—Argic Cryoborolls, loamy-skeletal, mixed—7 percent
- Inclusion 2: Argic Lithic Cryoborolls, 15 to 30 percent slopes—Argic Lithic Cryoborolls, loamy-skeletal, mixed—5 percent
- Inclusion 3: Rock outcrop—2 percent
- Inclusion 4: Rubble land—1 percent

### **Characteristics of the Layview Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex



*Dominant present vegetation:* Low sagebrush, black sagebrush, bluegrass, small rabbitbrush

#### **Typical Profile**

0 to 3 inches—extremely cobbly loam; 50 to 65 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

3 to 12 inches—very gravelly loam, very gravelly clay loam; 10 to 15 percent cobbles and stones and 50 to 60 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

12 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 0.9 to 1.1 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Packer Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Mixed alluvium influenced by loess

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, bluegrass, Idaho fescue

#### **Typical Profile**

0 to 10 inches—gravelly loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4

10 to 21 inches—extremely cobbly clay loam, extremely cobbly loam; 40 to 55 percent cobbles and stones and 55 to 70 percent pebbles (by weight); angular

blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

21 to 60 inches or more—extremely cobbly loam, extremely cobbly sandy loam; 40 to 55 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 3.6 to 5.4 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—3; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Hapgood Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—colluvium influenced by volcanic ash; source—volcanic rock

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, snowberry, Idaho fescue, needlegrass, lupine

#### **Typical Profile**

0 to 17 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

17 to 40 inches—very gravelly loam; 5 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

40 to 60 inches or more—very cobbly loam, very gravelly loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.2); nonsaline (less

than 2 mmhos/cm); nonsodic (SAR less than 2);  
estimated Unified classification—GC, GM-GC;  
estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 4.8 to 6.0 inches  
*Water-supplying capacity:* 16 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Shoulders and upper side slopes of mountains  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Black sagebrush, low sagebrush, bluegrass

#### Inclusion 2

*Position on landscape:* Concave snow pockets on north-facing side slopes of mountains  
*Contrasting features:* Receives additional moisture from drifted snow  
*Distinctive present vegetation:* Idaho fescue, snowberry

#### Inclusion 3

*Position on landscape:* Random small peaks and ridges of mountains  
*Contrasting features:* Bedrock exposed at the soil surface  
*Distinctive present vegetation:* Barren

#### Inclusion 4

*Position on landscape:* Rock stripes on side slopes of mountains below rock outcrop  
*Contrasting features:* More than 90 percent stones on the surface  
*Distinctive present vegetation:* Barren

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Layview soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Packer soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Hapgood soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

### Ratings of the Layview Soil for Selected Uses

*Range seeding:* Poor—droughty, large stones  
*Daily cover for landfill:* Poor—small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Severe—depth to bedrock  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, depth to bedrock  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Packer Soil for Selected Uses

*Range seeding:* Fair—erodes easily, small stones  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines, large stones  
*Gravel:* Improbable source—excess fines, large stones  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—seepage, slope  
*Embankments, dikes, and levees:* Severe—seepage, large stones

### Ratings of the Hapgood Soil for Selected Uses

*Range seeding:* Fair—erodes easily, small stones  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—large stones

### Interpretive Groups

*Capability classification:* Layview soil—VIIIs, nonirrigated; Packer soil—VIe, nonirrigated; Hapgood soil—VIe, nonirrigated  
*Range site:* Layview soil—024X016N; Packer soil—028B037N; Hapgood soil—024X032N

## 3950—Hooplite-Jung-Izod association

### Map Unit Setting

*Position on landscape:* Mountains  
*Elevation:* 6,200 to 6,600 feet

*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 47 degrees F  
*Frost-free season:* About 105 days

### **Composition**

#### *Major components:*

- Hooplite very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—50 percent
- Jung very gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—20 percent
- Izod very cobbly loam, 30 to 75 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—15 percent

#### *Contrasting inclusions:*

- Inclusion 1: Lithic Xerollic Haplargids, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 2: Xerollic Haplargids, 15 to 30 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—4 percent
- Inclusion 3: Lithic Torriorthents, 30 to 75 percent slopes—Lithic Torriorthents, clayey-skeletal, montmorillonitic (calcareous), mesic—3 percent
- Inclusion 4: Rock outcrop—3 percent

### **Characteristics of the Hooplite Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolitic tuff

*Slope features:* Length—short; shape—smooth or slightly convex

*Dominant present vegetation:* Black sagebrush, bluegrass, needlegrass, bottlebrush squirreltail, small rabbitbrush

#### **Typical Profile**

- 0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
- 4 to 8 inches—very gravelly loam, very gravelly clay loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6
- 8 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 0.7 to 0.9 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Jung Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bottlebrush squirreltail

#### **Typical Profile**

- 0 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 8 to 19 inches—very cobbly clay, very gravelly clay loam, very cobbly clay loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; very hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-7
- 19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.9 to 2.4 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### **Characteristics of the Izod Soil**

*Position on landscape:* East-facing side slopes of mountains  
*Parent material:* Kind—residuum; source—limestone  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Black sagebrush, small rabbitbrush, Sandberg bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 4 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM, GM-GC, GM; estimated AASHTO classification—A-4, A-2  
 4 to 10 inches—very gravelly loam, very gravelly fine sandy loam, extremely gravelly sandy loam; 0 to 25 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2  
 10 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 7 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 0.4 to 0.6 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing side slopes of mountains

*Contrasting features:* Moderately deep  
*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper

#### **Inclusion 2**

*Position on landscape:* Foot slopes of mountains  
*Contrasting features:* Moderately deep  
*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass

#### **Inclusion 3**

*Position on landscape:* Eroded parts of lower side slopes of mountains  
*Contrasting features:* Thin surface layer  
*Distinctive present vegetation:* Spiny hopsage, black sagebrush

#### **Inclusion 4**

*Position on landscape:* Scattered peaks of mountains  
*Contrasting features:* Bedrock exposed at surface  
*Distinctive present vegetation:* Barren

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Hooplite soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Suitability of the Jung soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Izod soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### **Ratings of the Hooplite Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, slope, small stones  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Jung Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones  
*Daily cover for landfill:* Poor—depth to bedrock, small stones  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Severe—depth to bedrock  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, too clayey

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Izod Soil for Selected Uses**

*Range seeding:* Poor—droughty, large stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Hooplite soil—VIIs, nonirrigated;

Jung soil—VIIs, nonirrigated; Izod soil—VIIs, nonirrigated

*Range site:* Hooplite soil—024X030N; Jung soil—024X030N; Izod soil—024X030N

### **3961—Pineval-Orovada-Beoska association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 5,900 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Pineval very cobbly loam, 2 to 8 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, mesic—35 percent
  - Orovada cobbly fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—30 percent
  - Beoska very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—25 percent
- Contrasting inclusions:*
- Inclusion 1: Typic Camborthids, 15 to 30 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—4 percent
  - Inclusion 2: Xerollic Haplargids, 15 to 30 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—4 percent
  - Inclusion 3: Settlemyer fine sandy loam, drained, 0 to

4 percent slopes—Fluvaquentic Haplaquolls, fine-loamy, mixed, mesic—2 percent

#### **Characteristics of the Pineval soil**

*Position on landscape:* Upper summits of fan piedmont remnants

*Parent material:* Gravelly mixed alluvium

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, small rabbitbrush

#### **Typical Profile**

0 to 5 inches—very cobbly loam; 30 to 40 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4

5 to 11 inches—very gravelly loam, very gravelly clay loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

11 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly sandy loam; 50 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 3.0 to 4.2 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

#### **Characteristics of the Orovada Soil**

*Position on landscape:* Inset fans

*Parent material:* Loess influenced by volcanic ash over mixed alluvium

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, small rabbitbrush, bottlebrush squirreltail

### Typical Profile

0 to 8 inches—cobbly fine sandy loam; 25 to 35 percent cobbles and stones and 10 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

8 to 26 inches—loam, fine sandy loam; 5 to 20 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

26 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 20 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 8.4 to 9.6 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—moderate

*Potential frost action:* Moderate

### Characteristics of the Beoska Soil

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Loess over loamy and gravelly mixed alluvium

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

### Typical Profile

0 to 13 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline

(2 to 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

13 to 24 inches—silty loam, silty clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 25 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

24 to 55 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (16 to 30 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

55 to 60 inches or more—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* In the upper 24 inches—moderately slow; below this depth—moderately rapid

*Available water capacity:* 7.9 to 9.8 inches

*Water-supplying capacity:* 7 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—high

*Potential frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave, south-facing side slopes of fan piedmont remnants

*Contrasting features:* Slopes of 15 to 30 percent

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, shadscale, bluegrass

#### Inclusion 2

*Position on landscape:* North-facing side slopes of fan piedmont remnants

*Contrasting features:* Slopes of 15 to 30 percent

*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass, needlegrass

### **Inclusion 3**

*Position on landscape:* Upper part of inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Wildlife habitat elements:**

*Suitability of the Pineval soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Beoska soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

### **Ratings of the Pineval Soil for Selected Uses**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—seepage, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action, flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Topsoil:* Poor—small stones, area reclaim

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—seepage

### **Ratings of the Orovada Soil for Selected Uses**

*Range seeding:* Fair—too arid, large stones

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

### **Ratings of the Beoska Soil for Selected Uses**

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Daily cover for landfill:* Poor—small stones

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, excess salt, area reclaim

*Pond reservoir areas:* Severe—seepage

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### **Interpretive Groups**

*Capability classification:* Pineval soil—VIIs, nonirrigated; Orovada soil—VIIs, nonirrigated; Beoska soil—IIIe, irrigated, and VIIs, nonirrigated

*Range site:* Pineval soil—024X005N; Orovada soil—024X005N; Beoska soil—024X002N

## **3990—Settlemyer fine sandy loam, drained, 0 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Inset fans

*Elevation:* 5,000 to 6,300 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Settlemyer fine sandy loam, drained, 0 to 4 percent slopes—Fluvaquentic Haplaquolls, fine-loamy, mixed, mesic—85 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, 0 to 4 percent slopes—Xeric Torriorthents, fine-loamy, mixed (calcareous), mesic—7 percent

- Inclusion 2: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—7 percent

- Inclusion 3: Settlemyer fine sandy loam, 0 to 2 percent slopes, frequently flooded—Fluvaquentic Haplaquolls, fine-loamy, mixed, mesic—1 percent

### **Characteristics of the Settlemyer Soil**

*Position on landscape:* Entrenched inset fans along drainageways of foothills and mountains

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye

### **Typical Profile**

0 to 10 inches—fine sandy loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-4

10 to 36 inches—silt loam, silty clay loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

36 to 60 inches or more—fine sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* December through March—36 to 48 inches; rest of year—below 48 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 9.4 to 11.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Areas adjacent to channels

*Contrasting features:* Slightly saline

*Distinctive present vegetation:* Basin big sagebrush, black greasewood, basin wildrye

#### Inclusion 2

*Position on landscape:* Fanlettes from adjacent foothills

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### Inclusion 3

*Position on landscape:* Flood plains of inset fans

*Contrasting features:* Poorly drained

*Distinctive present vegetation:* Creeping wildrye, basin wildrye, rush, sedge

### Major Uses

**Current uses:** Rangeland, wildlife habitat, nonirrigated cropland

### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—fair; shallow water areas—poor

### Ratings of the Settlemeier Soil for Selected Uses

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Fair—too clayey, wetness

*Shallow excavations:* Moderate—wetness

*Local roads and streets:* Severe—frost action, low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones

*Pond reservoir areas:* Moderate—slope

*Embankments, dikes, and levees:* Moderate—wetness

### Interpretive Groups

*Capability classification:* Settlemeier soil—IIw, irrigated, and VIw, nonirrigated

*Range site:* Settlemeier soil—025X003N

## 3992—Settlemeier, drained-Settlemeier loams

### Map Unit Setting

*Position on landscape:* Inset fans

*Elevation:* 5,000 to 6,300 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Settlemeier loam, drained, 2 to 4 percent slopes—Fluvaquentic Haplaquolls, fine-loamy, mixed, mesic—65 percent

- Settlemeier loam, 0 to 2 percent slopes, frequently flooded—Fluvaquentic Haplaquolls, fine-loamy, mixed, mesic—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 2 to 8 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—9 percent

- Inclusion 2: Xeric Torriorthents, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—6 percent

### Characteristics of the Settlemeier, Drained, Soil

*Position on landscape:* Entrenched inset fans along intermountain drainageways and foothills

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye



### Typical Profile

- 0 to 16 inches—loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6
- 16 to 40 inches—silt loam, silty clay loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
- 40 to 60 inches or more—fine sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to seasonal high water table:* December through March—36 to 48 inches; rest of year—below 48 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 9.4 to 11.0 inches

*Water-supplying capacity:* 12 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### Characteristics of the Settlemyer Soil

*Position on landscape:* Flood plains of inset fans along drainageways of mountains and foothills

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Creeping wildrye, sedge, rush, basin wildrye

### Typical Profile

- 0 to 15 inches—loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 15 to 35 inches—silty clay loam, clay loam; massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR

less than 5); estimated Unified classification—CL; estimated AASHTO classification—A-6

- 35 to 60 inches or more—stratified very gravelly loamy sand to silty clay loam; 15 to 40 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL-ML, GM-GC, GC, CL; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to seasonal high water table:* December through May—12 to 36 inches; rest of year—below 36 inches

*Flooding:* Frequency—frequent; duration—brief; months—December to March

*Permeability:* Moderately slow

*Available water capacity:* 11.0 to 13.0 inches

*Water-supplying capacity:* 15 inches

*Runoff:* Very slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Overplaced fanettes and foot slopes from adjacent mountain front

*Contrasting features:* Very gravelly throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, bluegrass

#### Inclusion 2

*Position on landscape:* Areas adjacent to abandoned stream channels

*Contrasting features:* Very gravelly throughout the profile

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### Major Uses

**Current uses:** Rangeland, wildlife habitat, nonirrigated cropland

#### Wildlife habitat elements:

*Suitability of the Settlemyer, drained, soil for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Suitability of the Settlemyer soil for named elements:* Grain and seed crops (irrigated)—fair; domestic

grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—good; shallow water areas—good

### **Ratings of the Settlemyer, Drained, Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Fair—too clayey, wetness

*Shallow excavations:* Moderate—wetness

*Local roads and streets:* Severe—frost action, low strength

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones

*Pond reservoir areas:* Moderate—slope

*Embankments, dikes, and levees:* Moderate—wetness

### **Ratings of the Settlemyer Soil for Selected Uses**

*Range seeding:* Good

*Daily cover for landfill:* Poor—wetness

*Shallow excavations:* Severe—wetness, cutbanks cave

*Local roads and streets:* Severe—frost action, low strength, flooding

*Roadfill:* Fair—wetness

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, too clayey, area reclaim

*Pond reservoir areas:* Moderate—seepage

*Embankments, dikes, and levees:* Severe—wetness, piping

### **Interpretive Groups**

*Capability classification:* Settlemyer, drained, soil—IIw, irrigated, and VIw, nonirrigated; Settlemyer soil—IIIw, irrigated, and Vw, nonirrigated

*Range site:* Settlemyer, drained, soil—025X003N; Settlemyer soil—025X001N

## **4051—Attella-Xine-Kram association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 90 days

### **Composition**

*Major components:*

- Attella very gravelly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), frigid—45 percent

- Xine gravelly loam, 30 to 50 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—30 percent
- Kram very cobbly loam, 15 to 30 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent

- Inclusion 2: Durorthidic Xeric Torriorthents, 2 to 8 percent slopes—Durorthidic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

### **Characteristics of the Attella Soil**

*Position on landscape:* East-, west-, and upper south-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—dolomite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Singleleaf pinyon,

Wyoming big sagebrush, bluegrass, Utah juniper

*Surface cover:* 80 percent pebbles, 5 percent flagstones

### **Typical Profile**

0 to 3 inches—very gravelly loam; 5 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very gravelly loam, very gravelly silt loam; 5 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2

7 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 0.7 to 1.0 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Xine Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—colluvium over residuum; source—limestone and calcareous shale

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, Idaho fescue, bluebunch wheatgrass

*Surface cover:* 15 percent pebbles

### **Typical Profile**

0 to 10 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

10 to 33 inches—very cobbly loam, very cobbly sandy loam; 35 to 50 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2, A-4

33 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* 3.5 to 4.2 inches

*Water-supplying capacity:* 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Characteristics of the Kram Soil**

*Position on landscape:* South-facing, lower side slopes of mountains

*Parent material:* Kind—residuum; source—limestone

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, bluegrass, black sagebrush

*Surface cover:* 25 percent pebbles, 15 percent cobbles, 2 percent stones

### **Typical Profile**

0 to 4 inches—very cobbly loam; 35 to 45 percent cobbles and stones and 30 to 45 percent pebbles (by weight); granular structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

4 to 13 inches—very gravelly very fine sandy loam, very gravelly loam; 10 to 15 percent cobbles and stones and 45 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

13 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 1.0 to 1.2 inches

*Water-supplying capacity:* 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Random small peaks and severely eroded side slopes of mountains

*Contrasting features:* Bedrock exposed at the soil surface

*Distinctive present vegetation:* Barren

#### **Inclusion 2**

*Position on landscape:* Entrenched drainageways and inset fan remnants

*Contrasting features:* Slopes of 2 to 8 percent, receives additional moisture from runoff

*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, woodland

**Woodland on the Attella soil:**

*Site index for common trees:* Singleleaf pinyon—40;

Utah juniper—40

*Most important native understory plants:* Mountain big sagebrush, bluegrass

**Woodland on the Kram soil:**

*Site index for common trees:* Singleleaf pinyon—25;

Utah juniper—25

*Most important native understory plants:* Black sagebrush, bluegrass, ephedra

**Wildlife habitat elements:**

*Suitability of the Attella soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Xine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Kram soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Attella Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, slope, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Xine Soil for Selected Uses**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, large stones, slope

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—slope, small stones

*Pond reservoir areas:* Severe—slope, seepage

*Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Kram Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Attella soil—VIIs, nonirrigated; Xine soil—VIIe, nonirrigated; Kram soil—VIIs, nonirrigated

*Woodland suitability group:* Attella soil—1R; Kram soil—1X

*Range site:* Attella soil—025X062N; Xine soil—024X021N; Kram soil—025X063N

**4070—Genaw-Wieland-Grina association****Map Unit Setting**

*Position on landscape:* Fan piedmonts and foothills

*Elevation:* 5,700 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 105 days

**Composition**

*Major components:*

- Genaw gravelly loam, 15 to 30 percent slopes—Xerollic Haplargids, loamy, mixed, mesic, shallow—35 percent

- Wieland gravelly loam, 4 to 15 percent slopes—Durixerollic Haplargids, fine, montmorillonitic, mesic—30 percent

- Grina very gravelly loam, 15 to 30 percent slopes, eroded—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, fine-loamy, mixed, mesic—8 percent

- Inclusion 2: Typic Natrargids, 8 to 15 percent slopes—Typic Natrargids, fine, montmorillonitic, mesic—4 percent

- Inclusion 3: Durixerollic Camborthids, 2 to 4 percent slopes—Durixerollic Camborthids, fine-loamy, mixed, mesic—3 percent

**Characteristics of the Genaw Soil**

*Position on landscape:* Side slopes of foothills and fan piedmont remnants with a rock core

*Parent material:* Kind—loess mantled residuum; source—tuffaceous sediments  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, spiny hopsage

### Typical Profile

0 to 6 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4  
 6 to 11 inches—gravelly loam, gravelly clay loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6  
 11 to 16 inches—gravelly sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 45 to 65 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
 16 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 1.9 to 2.4 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Wieland Soil

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Mixed alluvium influenced by loess and volcanic ash  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, needlegrass, bluegrass

### Typical Profile

0 to 8 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6  
 8 to 20 inches—gravelly clay, clay; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); prismatic structure; hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CH, SC; estimated AASHTO classification—A-7  
 20 to 60 inches or more—loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones and 10 to 45 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4, A-2

### Soil and Water Features

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 5.7 to 9.2 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Grina Soil

*Position on landscape:* Side slopes of foothills and fan piedmont remnants with a rock core  
*Parent material:* Kind—residuum; source—tuffaceous sediments  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, small rabbitbrush, Utah juniper

### Typical Profile

0 to 3 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 55 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

3 to 14 inches—loam, silty clay loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

14 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.7 to 2.5 inches  
*Water-supplying capacity:* 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave inset fans on fan piedmont remnants  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

#### Inclusion 2

*Position on landscape:* Concave side slopes of fan piedmont remnants  
*Contrasting features:* 10 to 30 percent eroded surface layer  
*Distinctive present vegetation:* Big sagebrush, Indian ricegrass, rabbitbrush, galleta

#### Inclusion 3

*Position on landscape:* Concave inset fans at base of foothills  
*Contrasting features:* Receives additional moisture from runoff  
*Distinctive present vegetation:* Basin wildrye, basin big sagebrush, black greasewood, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Woodland on the Grina soil:**

*Site index for common trees:* Utah juniper—18

*Most important native understory plants:* Wyoming big sagebrush, ephedra, bluegrass

### Wildlife habitat elements:

*Suitability of the Genaw soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Wieland soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Grina soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

### Ratings of the Genaw Soil for Selected Uses

*Range seeding:* Poor—droughty  
*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Wieland Soil for Selected Uses

*Range seeding:* Poor—rooting depth  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Moderate—too clayey, slope  
*Local roads and streets:* Severe—low strength, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Moderate—thin layer

### Ratings of the Grina Soil for Selected Uses

*Range seeding:* Poor—droughty, small stones  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—low strength, slope  
*Roadfill:* Poor—depth to bedrock, slope, low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope, depth to bedrock  
*Pond reservoir areas:* Severe—slope, depth to bedrock  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Genaw soil—VIIe, nonirrigated;

Wieland soil—VIs, nonirrigated; Grina soil—VIIe, nonirrigated

*Range site:* Genaw soil—024X005N; Wieland soil—024X005N; Grina soil—025X059N

*Woodland suitability group:* Grina soil—1D

## 4071—Genaw-Perlor-Puett association

### Map Unit Setting

*Position on landscape:* Foothills

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Genaw very fine sandy loam, 4 to 15 percent slopes—Xerollic Haplargids, loamy, mixed, mesic, shallow—35 percent
- Perlor very fine sandy loam, 4 to 15 percent slopes—Typic Torriorthents, loamy, mixed (calcareous), mesic, shallow—30 percent
- Puett very gravelly loam, 15 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, 4 to 15 percent slopes—Xerollic Haplargids, loamy, mixed, mesic—5 percent
- Inclusion 2: Xerollic Camborthids, 2 to 8 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Xerollic Haplargids, 4 to 15 percent slopes—Xerollic Haplargids, loamy, mixed, mesic, shallow—5 percent

### Characteristics of the Genaw Soil

*Position on landscape:* Side slopes of foothills

*Parent material:* Kind—loess mantled residuum; source—tuffaceous sediments

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bluegrass, spiny hopsage

*Surface cover:* 5 percent pebbles, 5 percent cobbles

### Typical Profile

0 to 6 inches—very fine sandy loam; 5 to 15 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-4

6 to 11 inches—gravelly loam, gravelly clay loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6

11 to 16 inches—gravelly sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 40 to 65 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

16 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 1.9 to 2.4 inches

*Water-supplying capacity:* 8 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.49; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Characteristics of the Perlor Soil

*Position on landscape:* South-facing shoulder slopes of foothills

*Parent material:* Kind—residuum influenced by loess; source—tuffaceous sediments

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

*Surface cover:* 10 percent pebbles

### Typical Profile

0 to 7 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 20 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

7 to 14 inches—loam, sandy loam, very gravelly sandy loam; 0 to 5 percent cobbles and stones and 5 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH

8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
14 inches or more—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 1.6 to 2.6 inches  
*Water-supplying capacity:* 6 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.37; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Low

### Characteristics of the Puett Soil

*Position on landscape:* Deeply incised side slopes of foothills  
*Parent material:* Kind—loamy residuum; source—soft, tuffaceous sedimentary formations  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, small rabbitbrush, Wyoming big sagebrush, Utah juniper

### Typical Profile

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-1  
4 to 15 inches—coarse sandy loam, gravelly sandy loam, loam; 10 to 50 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML, GM; estimated AASHTO classification—A-1, A-2, A-4  
15 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 1.7 to 2.1 inches

*Water-supplying capacity:* 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Convex toe slopes of foothills

*Contrasting features:* Very deep

*Distinctive present vegetation:* Wyoming big sagebrush, bluegrass, spiny hopsage

#### Inclusion 2

*Position on landscape:* Inset fans

*Contrasting features:* Receives additional moisture from runoff

*Distinctive present vegetation:* Wyoming big sagebrush, needlegrass, bluegrass

#### Inclusion 3

*Position on landscape:* Convex, north-facing side slopes and shoulder slopes of foothills

*Contrasting features:* Layer of lime accumulation at a depth of 5 inches

*Distinctive present vegetation:* Black sagebrush, rabbitbrush, bottlebrush squirreltail

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability of the Genaw soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Perlor soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Puett soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

#### Ratings of the Genaw Soil for Selected Uses

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—slope, depth to bedrock, frost action

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, slope



*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Perlur Soil for Selected Uses**

*Range seeding:* Poor—droughty, too arid  
*Daily cover for landfill:* Poor—depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Moderate—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Puett Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones  
*Daily cover for landfill:* Poor—depth to bedrock, slope  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, small stones, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—seepage, piping

#### **Interpretive Groups**

*Capability classification:* Genaw soil—VIIIs, nonirrigated;  
 Perlur soil—VIIIs, nonirrigated; Puett soil—VIIIs,  
 nonirrigated  
*Range site:* Genaw soil—024X020N; Perlur soil—  
 024X002N; Puett soil—025X025N

### **4072—Genaw-Orovada-Puett association**

#### **Map Unit Setting**

*Position on landscape:* Hills  
*Elevation:* 5,600 to 6,000 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 110 days

#### **Composition**

##### **Major components:**

- Genaw very fine sandy loam, 4 to 15 percent slopes—Xerollic Haplargids, loamy, mixed, mesic, shallow—40 percent
- Orovada fine sandy loam, 2 to 8 percent slopes, rarely flooded—Durixerollic Camborthids, coarse-loamy, mixed, mesic—30 percent
- Puett fine sandy loam, 15 to 30 percent slopes—Xeric

Torriorthents, loamy, mixed (calcareous), mesic, shallow—15 percent

##### **Contrasting inclusions:**

- Inclusion 1: Xeric Torriorthents, 15 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—6 percent
- Inclusion 2: Xerollic Haplargids, 15 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow—5 percent
- Inclusion 3: Xeric Torriorthents, 4 to 15 percent slopes—Xeric Torriorthents, sandy, mixed, mesic—4 percent

#### **Characteristics of the Genaw Soil**

*Position on landscape:* Side slopes of hills

*Parent material:* Kind—loess mantled residuum;  
 source—tuffaceous sediments

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

#### **Typical Profile**

- 0 to 6 inches—very fine sandy loam; 5 to 15 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-4
- 6 to 11 inches—gravelly loam, gravelly clay loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6
- 11 to 16 inches—gravelly sandy loam, very gravelly loam; 0 to 5 percent cobbles and stones and 40 to 65 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 10); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
- 16 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 1.9 to 2.4 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.49; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Orovida Soil**

*Position on landscape:* Inset fans  
*Parent material:* Loess capped mixed alluvium  
*Slope features:* Length—short; shape—smooth to concave  
*Dominant present vegetation:* Wyoming big sagebrush, small rabbitbrush, Sandberg bluegrass, littleleaf horsebrush

### **Typical Profile**

0 to 8 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4  
 8 to 20 inches—loam, fine sandy loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
 20 to 60 inches or more—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* 8.4 to 9.6 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Puett Soil**

*Position on landscape:* Deeply incised side slopes of hills

*Parent material:* Kind—loamy residuum; source—soft, tuffaceous sedimentary formations  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, small rabbitbrush, Wyoming big sagebrush, invading Utah juniper

### **Typical Profile**

0 to 4 inches—fine sandy loam; 5 to 15 pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4  
 4 to 15 inches—coarse sandy loam, sandy loam, fine sandy loam; 5 to 25 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-1, A-2, A-4  
 15 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 1.8 to 2.2 inches  
*Water-supplying capacity:* 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex, south-facing erosional side slopes of hills  
*Contrasting features:* Soft bedrock at a depth of 4 to 10 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, shadscale, galleta, bluegrass, needlegrass

#### **Inclusion 2**

*Position on landscape:* Concave, north-facing back slopes of hills  
*Contrasting features:* Very gravelly throughout the profile  
*Distinctive present vegetation:* Black sagebrush, small rabbitbrush, bluegrass

**Inclusion 3**

*Position on landscape:* Dunes overplacing the base of hills

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Spiny hopsage, wheatgrass, Indian ricegrass, Wyoming big sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements:**

*Suitability of the Genaw soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Orovada soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Puett soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings of the Genaw Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—slope, depth to bedrock, frost action

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Orovada Soil for Selected Uses**

*Range seeding:* Fair—too arid

*Daily cover for landfill:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones, thin layer

*Pond reservoir areas:* Moderate—seepage, slope

*Embankments, dikes, and levees:* Severe—piping

**Ratings of the Puett Soil for Selected Uses**

*Range seeding:* Poor—droughty

*Daily cover for landfill:* Poor—depth to bedrock, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—seepage, piping

**Interpretive Groups**

*Capability classification:* Genaw soil—VIIIs, nonirrigated; Orovada soil—IIIs, irrigated, and VIIs, nonirrigated; Puett soil—VIIIs, nonirrigated

*Range site:* Genaw soil—028B010N; Orovada soil—028B010N; Puett soil—025X025N

**4091—Coztur-Genaw association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 6,600 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 90 days

**Composition**

*Major components:*

- Coztur loam, 2 to 8 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—50 percent
- Genaw very fine sandy loam, 4 to 15 percent slopes—Xerollic Haplargids, loamy, mixed, mesic, shallow—35 percent

*Contrasting inclusions:*

- Inclusion 1: Puett very gravelly loam, 30 to 50 percent slopes—Xeric Torriorthents, loamy, mixed (calcareous), mesic, shallow—6 percent
- Inclusion 2: Xerollic Haplargids, 4 to 15 percent slopes—Xerollic Haplargids, fine-loamy, mixed, mesic—6 percent
- Inclusion 3: Durixerollic Camborthids, 2 to 8 percent slopes—Durixerollic Camborthids, fine-loamy, mixed, frigid—3 percent

**Characteristics of the Coztur Soil**

*Position on landscape:* Crests of mountains

*Parent material:* Kind—residuum; source—volcanic rock, rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming and mountain big sagebrush, bluegrass, needlegrass, Utah juniper

*Surface cover:* 10 percent pebbles

**Typical Profile**

0 to 11 inches—loam; 10 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2);

estimated Unified classification—SM-SC, CL-ML;  
estimated AASHTO classification—A-4

11 to 17 inches—loam, clay loam; 5 to 15 percent  
pebbles (by weight); subangular blocky structure;  
slightly hard, friable; mildly alkaline (pH 7.8);  
nonsaline (less than 2 mmhos/cm); nonsodic (SAR  
less than 2); estimated Unified classification—CL;  
estimated AASHTO classification—A-6  
17 inches or more—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.6 to 3.4 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.43; T value—  
1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### **Characteristics of the Genaw Soil**

*Position on landscape:* Side slopes of mountains  
*Parent material:* Kind—loess mantled residuum;  
source—tuffaceous sediments  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush,  
bluegrass, spiny hopsage

### **Typical Profile**

0 to 6 inches—very fine sandy loam; 5 to 15 percent  
pebbles (by weight); subangular blocky structure;  
slightly hard, very friable; moderately alkaline (pH  
8.2); nonsaline (less than 2 mmhos/cm); nonsodic  
(SAR less than 5); estimated Unified classification—  
SM-SC, SM; estimated AASHTO classification—A-4  
6 to 11 inches—gravelly loam, gravelly clay loam; 0 to 5  
percent cobbles and stones and 25 to 45 percent  
pebbles (by weight); angular blocky structure;  
slightly hard, very friable; moderately alkaline (pH  
8.2); nonsaline (less than 4 mmhos/cm); nonsodic  
(SAR less than 5); estimated Unified classification—  
GC, SC; estimated AASHTO classification—A-6  
11 to 16 inches—gravelly sandy loam, very gravelly  
loam; 0 to 5 percent cobbles and stones and 40 to  
65 percent pebbles (by weight); massive; hard,  
friable; strongly alkaline (pH 8.6); nonsaline (less  
than 4 mmhos/cm); nonsodic (SAR less than 10);

estimated Unified classification—GM-GC; estimated  
AASHTO classification—A-2

16 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 1.9 to 2.4 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.49; T value—  
1; wind erodibility group—3  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Convex erosion ballenas on side  
slopes of mountains  
*Contrasting features:* 10 to 25 percent eroded areas  
*Distinctive present vegetation:* Wyoming big sagebrush,  
black sagebrush, Utah juniper

#### **Inclusion 2**

*Position on landscape:* Shoulders and convex upper  
side slopes of hills  
*Contrasting features:* Bedrock at a depth of 20 to 30  
inches  
*Distinctive present vegetation:* Wyoming big sagebrush,  
bottlebrush squirreltail

#### **Inclusion 3**

*Position on landscape:* Drainageways of mountains  
*Contrasting features:* Bedrock at a depth of more than  
60 inches  
*Distinctive present vegetation:* Wyoming and mountain  
big sagebrush, needlegrass, bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Wildlife habitat elements:**

*Suitability of the Coztur soil for named elements:* Wild  
herbaceous plants (nonirrigated)—fair; shrubs  
(nonirrigated)—fair  
*Suitability of the Genaw soil for named elements:* Wild  
herbaceous plants (nonirrigated)—fair; shrubs  
(nonirrigated)—fair

#### **Ratings of the Coztur Soil for Selected Uses**

*Range seeding:* Fair—droughty, depth to bedrock  
*Daily cover for landfill:* Poor—depth to bedrock

*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Severe—depth to bedrock  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock  
*Pond reservoir areas:* Severe—depth to bedrock  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Genaw Soil for Selected Uses**

*Range seeding:* Poor—droughty  
*Daily cover for landfill:* Poor—depth to bedrock, small stones  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Moderate—slope, depth to bedrock, frost action  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—depth to bedrock, slope  
*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Coztur soil—VIIs, nonirrigated;  
 Genaw soil—VIIs, nonirrigated  
*Range site:* Coztur soil—025X014N; Genaw soil—024X005N

### **4093—Coztur-Teguro-Punchbowl association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,300 to 6,600 feet  
*Average annual precipitation:* About 11 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 90 days

#### **Composition**

##### *Major components:*

- Coztur gravelly loam, 8 to 15 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—50 percent
- Teguro very gravelly loam, 15 to 50 percent slopes—Lithic Argixerolls, loamy, mixed, frigid—20 percent
- Punchbowl gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy, mixed, frigid—15 percent

##### *Contrasting inclusions:*

- Inclusion 1: Durixerollic Haplargids, 4 to 15 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, frigid—8 percent
- Inclusion 2: Lithic Xerollic Haplargids, 50 to 75 percent

slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—4 percent

- Inclusion 3: Durixerollic Haplargids, 8 to 15 percent slopes—Durixerollic Haplargids, loamy-skeletal, mixed, frigid—3 percent

#### **Characteristics of the Coztur Soil**

*Position on landscape:* Upper crests and side slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock, rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, mountain big sagebrush, bluegrass, needlegrass, Utah juniper

#### **Typical Profile**

0 to 11 inches—gravelly loam; 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-2, A-4  
 11 to 17 inches—loam, clay loam; 5 to 15 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6  
 17 inches or more—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.6 to 3.4 inches  
*Water-supplying capacity:* 9 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

#### **Characteristics of the Teguro Soil**

*Position on landscape:* North- and east-facing shoulders and upper side slopes of mountains

*Parent material:* Kind—residuum; source—tuff

*Slope features:* Length—short; shape—slightly concave to irregular

*Dominant present vegetation:* Utah juniper, Idaho

fescue, mountain big sagebrush, pine bluegrass, singleleaf pinyon

### Typical Profile

- 0 to 6 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 6 to 16 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6
- 16 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.0 to 2.6 inches  
*Water-supplying capacity:* 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential frost action:* Moderate

### Characteristics of the Punchbowl Soil

*Position on landscape:* Lower crests and side slopes of mountains  
*Parent material:* Kind—residuum; source—andesite and rhyolite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, small rabbitbrush, bluegrass, phlox, singleleaf pinyon, Utah juniper

### Typical Profile

- 0 to 3 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4, A-2

- 3 to 6 inches—gravelly loam, loam; 0 to 5 percent cobbles and stones and 5 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6
- 6 to 10 inches—gravelly clay loam, gravelly sandy clay loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7
- 10 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 8 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.2 to 1.6 inches  
*Water-supplying capacity:* 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Concave toe slopes and inset fans

*Contrasting features:* Very deep

*Distinctive present vegetation:* Wyoming big sagebrush, mountain big sagebrush, bluegrass, basin wildrye

#### Inclusion 2

*Position on landscape:* Convex scarps adjacent to inset fans

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, shadscale, needlegrass, bluegrass

#### Inclusion 3

*Position on landscape:* Scattered shoulder slopes of adjacent hills

*Contrasting features:* Limestone parent material

*Distinctive present vegetation:* Utah juniper, Wyoming big sagebrush, bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Woodland on the Teguro soil:**

*Site index for common trees:* Singleleaf pinyon—55;  
Utah juniper—55

*Most important native understory plants:* Wyoming big sagebrush, bluebunch wheatgrass

**Wildlife habitat elements:**

*Suitability of the Coztur soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Teguro soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

*Suitability of the Punchbowl soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings of the Coztur Soil for Selected Uses**

*Range seeding:* Fair—droughty, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Teguro Soil for Selected Uses**

*Range seeding:* Poor—droughty, small stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Punchbowl Soil for Selected Uses**

*Range seeding:* Poor—droughty, depth to bedrock

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope  
*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Coztur soil—VIIIs, nonirrigated; Teguro soil—VIIIs, nonirrigated; Punchbowl soil—VIIe, nonirrigated

*Range site:* Coztur soil—025X014N; Teguro soil—025X062N; Punchbowl soil—024X030N

*Woodland suitability group:* Teguro soil—2R

**4140—Welch loam, drained, 2 to 8 percent slopes****Map Unit Setting**

*Position on landscape:* Inset fans

*Elevation:* 6,500 to 8,200 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 80 days

**Composition**

*Major components:*

- Welch loam, drained, 2 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—90 percent

*Contrasting inclusions:*

- Inclusion 1: Cumulic Haploxerolls, 2 to 8 percent slopes—Cumulic Haploxerolls, fine-loamy, mixed, frigid—6 percent

- Inclusion 2: Welch loam, 2 to 8 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, frigid—4 percent

**Characteristics of the Welch Soil**

*Position on landscape:* Slightly entrenched inset fans in narrow mountain valleys

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly concave

**Typical Profile**

0 to 4 inches—loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

4 to 60 inches—stratified sandy loam to silty clay loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

## Soil and Water Features

*Depth to seasonal high water table:* March through June—48 to 72 inches; rest of year—below 72 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 9.6 to 12 inches

*Water-supplying capacity:* 13 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Toe slopes adjacent to inset fans

*Contrasting features:* Moderately well drained

*Distinctive present vegetation:* Chokecherry, aspen, willow, rose, bluegrass

#### Inclusion 2

*Position on landscape:* Unentrenched, smooth flood plains of inset fans

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Creeping wildrye, alpine timothy, hairgrass, rush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Wildlife habitat elements:

*Suitability for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair

#### Ratings of the Welch Soil for Selected Uses

*Range seeding:* Good

*Daily cover for landfill:* Fair—too clayey

*Shallow excavations:* Moderate—wetness

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Fair—small stones

*Pond reservoir areas:* Slight

*Embankments, dikes, and levees:* Slight

### Interpretive Groups

*Capability classification:* IIIw, irrigated, and VIw, nonirrigated

*Range site:* 025X003N





# Prime Farmland

---

In this section, prime farmland is defined and discussed and the prime farmland soils in this survey area are listed.

Prime farmland is of major importance in meeting the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, seed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. Adequate moisture and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils either are used for producing food or fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland.

Prime farmland soils commonly get an adequate and dependable supply of moisture from precipitation or irrigation. Temperature and growing season are favorable, and the level of acidity or alkalinity is acceptable. The soils have few, if any, rocks, and are permeable to water and air. They are not excessively erodible or saturated with water for long periods, and are not flooded during the growing season. The slope ranges mainly from 0 to 6 percent.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland soils if the limitations are overcome by drainage, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information on the criteria for prime farmland soils can be obtained at the local office of the Soil Conservation Service.

A recent trend in land use has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

The following map units meet the soil requirements for prime farmland when irrigated. On some soils included in the list, measures should be used to overcome a hazard or limitation, such as flooding, wetness, or droughtiness. The location of each map unit is shown on the detailed soil maps at the back of this publication. Soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

The following map units or soils are prime farmland if irrigated:

|      |                                                                                    |
|------|------------------------------------------------------------------------------------|
| 140  | Antel silt loam                                                                    |
| 141  | Antel silt loam, moderately sodic                                                  |
| 142  | Antel silty clay loam                                                              |
| 143  | Antel silty clay loam, occasionally flooded                                        |
| 162  | Batan silt loam, occasionally flooded                                              |
| 163  | Batan silt loam, slightly saline                                                   |
| 2066 | Broyles and Dun Glen parts of Oxcorel-Broyles-Dun Glen association                 |
| 213  | Broyles part of Blacka-Broyles very fine sandy loam, saline, 2 to 4 percent slopes |
| 1144 | Broyles part of Wendane-Batan-Broyles association                                  |
| 232  | Broyles very fine sandy loam, cemented substratum, 0 to 2 percent slopes           |
| 233  | Broyles very fine sandy loam, moderately saline, 0 to 2 percent slopes             |
| 230  | Broyles very fine sandy loam, 0 to 2 percent slopes                                |
| 231  | Broyles very fine sandy loam, 2 to 4 percent slopes                                |
| 235  | Broyles-Creemon association                                                        |
| 247  | Bubus part of Bubus-Isolde association                                             |
| 442  | Bubus part of Gund-Bubus-Wendane association                                       |
| 1092 | Bubus part of Tulase-Bubus-McConnel association                                    |

|      |                                                                     |      |                                                            |
|------|---------------------------------------------------------------------|------|------------------------------------------------------------|
| 240  | Bubus very fine sandy loam                                          | 701  | Orovada fine sandy loam, 2 to 4 percent slopes             |
| 242  | Bubus very fine sandy loam, gravelly substratum                     | 703  | Orovada part of Orovada-Goldrun complex                    |
| 244  | Bubus-Relley complex                                                | 805  | Raglan silt loam                                           |
| 2600 | Caniwe part of Grina-Caniwe-Handy association                       | 800  | Raglan silt loam, gravelly substratum                      |
| 2602 | Caniwe part of Grina-Grina, eroded-Caniwe association               | 2640 | Rasille-Kelk association                                   |
| 298  | Creemon part of Creemon-Misad association                           | 850  | Relley silt loam                                           |
| 605  | Creemon part of Misad-Creemon-Rednik association                    | 851  | Relley silt loam, cemented substratum                      |
| 292  | Creemon silt loam, 0 to 2 percent slopes, occasionally flooded      | 853  | Relley silty clay loam                                     |
| 290  | Creemon silt loam, 0 to 2 percent slopes                            | 855  | Relley-Broyles association                                 |
| 291  | Creemon silt loam, 2 to 4 percent slopes                            | 3990 | Settlemyer fine sandy loam, drained, 0 to 4 percent slopes |
| 295  | Creemon-Cren association                                            | 2575 | Settlemyer part of Colbar-Perwick-Settlemyer association   |
| 296  | Creemon-Hessing association                                         | 1146 | Sonoma and Valmy parts of Wendane-Sonoma-Valmy association |
| 294  | Creemon-Orovada-Broyles association                                 | 990  | Sonoma silt loam, drained                                  |
| 297  | Creemon-Orovada-Tulase association                                  | 631  | Tulase part of McConnel-Tulase association                 |
| 304  | Cren and Raglan parts of Cren-Raglan-Batan association              | 1142 | Tweba part of Wendane-Tweba association                    |
| 303  | Cren and Relley parts of Cren-Doowak-Relley association             | 1102 | Tweba very fine sandy loam, drained, 0 to 4 percent slopes |
| 300  | Cren silt loam                                                      | 167  | Valmy part of Batan-Wendane-Valmy association              |
| 310  | Davey fine sandy loam                                               | 1150 | Weso fine sandy loam                                       |
| 312  | Davey fine sandy loam, cemented substratum                          | 182  | Whirlo part of Beoska-Whirlo-Misad association             |
| 313  | Davey part of Davey-Goldrun complex                                 | 2068 | Whirlo part of Oxcorel-Golconda-Whirlo association         |
| 3661 | Dun Glen part of Dun Glen-Whirlo association                        | 1280 | Whirlo part of Ricert-Oxcorel-Whirlo association           |
| 511  | Hessing silt loam                                                   | 1166 | Whirlo part of Whirlo-Pumper complex                       |
| 512  | Hessing-Relley association                                          | 1162 | Whirlo silt loam, 0 to 2 percent slopes                    |
| 3742 | Kelk part of Kelk-Ocala association                                 | 1163 | Whirlo silt loam, 2 to 4 percent slopes                    |
| 3740 | Kelk silt loam, saline, 0 to 4 percent slopes                       | 1165 | Whirlo-Creemon association                                 |
| 3741 | Kelk-Settlemyer association                                         | 1170 | Wholan silt loam                                           |
| 245  | Needle Peak and Yipor parts of Bubus-Needle Peak-Yipor association  | 1174 | Wholan silt loam, sandy substratum                         |
| 660  | Needle Peak silt loam, occasionally flooded                         | 1178 | Wholan-Rasille association                                 |
| 702  | Orovada fine sandy loam, cemented substratum, 0 to 2 percent slopes | 1177 | Wholan, strongly alkaline-Rasille association              |
| 700  | Orovada fine sandy loam, 0 to 2 percent slopes                      |      |                                                            |

# Use and Management of the Soils

---

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

## Crops and Pasture

The system of land capability classification used by the Soil Conservation Service is explained in this section, and general management needed for crops and pasture is suggested.

*Land capability classification* shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

*Capability classes*, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

*Capability subclasses* are soil groups within one class. They are designated by adding a small letter, e,

w, s, or c, to the class numeral, for example, 11e. The letter e shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by w, s, or c because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Planners of management systems for individual fields or farms in the survey area should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

The aim of good land use is to produce the greatest amount of the most desirable crops while also protecting and improving the soil. This can be achieved by seeding plants that are well suited to the soil and by applying proper management practices that protect the soil and maintain soil tilth.

Different management is needed on diverse kinds of soil. Basic essential practices, however, apply to all cultivated soils. These practices are discussed in the following paragraphs.

**Conservation cropping system.** A conservation cropping system consists of a crop rotation and cultural and management practices that protect the soil from erosion and maintain or improve fertility and tilth. It should include perennial legumes, grass-legume mixtures, or other crops that produce large quantities of residue to compensate for crops in the rotation that produce little or no residue.

A typical cropping system used in the survey area is 8 to 10 years of alfalfa followed by 2 years of small grain. Residue from small grain is returned to the soil, and tillage is kept to a minimum.

**Erosion control.** Protection of the surface layer from water erosion and wind erosion is important because this layer contains most of the organic matter and is generally more fertile than the rest of the soil. Wind erosion can be controlled by leaving a protective plant cover on the surface, by using minimum tillage during windy or stormy periods, and by tilling in spring and then immediately seeding. Water erosion generally is controlled by leveling and by applying irrigation water at the proper rate.

**Application of plant nutrients.** Most crops in the survey area respond well to applications of liquid or solid fertilizer. Specific fertilizer requirements are based on the kind of crop grown and the nutrient level of the soil. Applications of nitrogen and phosphorus increase the production of small grain and aid in establishing alfalfa. Unless the soils contain sufficient amounts of available phosphorus, established alfalfa generally requires only applications of phosphorus, which should be applied every 2 years throughout the duration of the stand.

**Irrigation water management.** Proper irrigation water management is the application of irrigation water at rates and in amounts adequate to produce high crop yields and to minimize soil and water losses. Water is applied according to the crop needs and the characteristics of the soil.

An efficient irrigation distribution system is one that has enough capacity to meet the needs of the crops grown during periods of peak use. The system should be located and controlled so that seepage losses are minimal and so that it carries the required flow without causing erosion.

Efficient application of water involves consideration of the available water capacity, the rate at which water enters and moves through the soil, and the amount of water required by the crop grown. Most crops should be irrigated when 40 to 50 percent of the available moisture in the top half of the root zone has been used.

**Management of salt- and sodium-affected soils.** Like most soils in arid and subarid regions, many of the soils in this survey area contain at least small quantities of soluble salts and sodium. In some soils high concentrations of salts and sodium limit or prevent the growth of crops. Because precipitation is low and the rate of evaporation is high, salts accumulate in the root zone. In addition, many low-lying areas receive salty water from runoff or seepage. Surface evaporation of this water generally results in an increase in content of soluble salts on or in the soils. In some areas that have a high water table, water rises in the soil by capillary action and carries dissolved salts with it. The soluble salts can be moved to any part of the soil profile.

A soil that contains excessive amounts of soluble salts is called a saline soil. One that contains excessive amounts of exchangeable sodium is called a sodic, or alkali, soil. A soil that contains excessive amounts of both soluble salts and sodium is called a saline-sodic soil. Saline-sodic phases of several of the soils in the survey have been mapped. The map unit name in most cases does not give the degree to which these soils are affected, nor does it indicate whether they contain both salts and sodium. This information is given in the map unit descriptions.

Four classes of salinity are recognized in the detailed soil map unit descriptions. These classes are as follows:

*Nonsaline soils* are those that contain less than 0.15 percent soluble salts. The electrical conductivity of the saturation extract is less than 4 millimhos per centimeter at 25 degrees C.

*Slightly saline soils* are those that contain 0.15 to 0.35 percent soluble salts. The electrical conductivity of the saturation extract is 4 to 8 millimhos per centimeter at 25 degrees C.

*Moderately saline soils* are those that contain 0.35 to 0.65 percent soluble salts. The electrical conductivity of the saturation extract is 8 to 16 millimhos per centimeter at 25 degrees C.

*Strongly saline soils* are those that contain more than 0.65 percent soluble salts. The electrical conductivity of the saturation extract is more than 16 millimhos per centimeter at 25 degrees C.

Four classes of sodicity are recognized in the detailed soil map unit descriptions. These classes are as follows:

*Nonsodic soils* contain less than 15 percent exchangeable sodium.

*Slightly sodic soils* contain 15 to 25 percent exchangeable sodium.

*Moderately sodic soils* contain 25 to 40 percent exchangeable sodium.

*Strongly sodic soils* contain more than 40 percent exchangeable sodium.

Soils differ in the kinds of salts they contain and in the practices needed for improvement; however, some general guidelines can be given. For example, an adequate supply of good-quality water and an adequate drainage system are needed to reclaim any saline or sodic soils. Two methods of applying water are commonly used. One method is land leveling that results in flat basins in which the water can accumulate. The other method involves leveling the land to a uniform grade and then flooding between border dikes. If drainage is adequate and if large amounts of water are used, the soluble salts can be leached out of the root zone by either method. The process is more difficult if a soil contains an excessive amount of exchangeable sodium. In addition to drainage and leaching, other practices are needed to improve sodium-affected soils.

Chemical amendments used to replace sodium are gypsum and its various forms, including gypsite, anhydrite, and selenite, as well as elemental sulfur, sulfuric acid, iron sulfate, and aluminum sulfate. Any of these amendments can be used successfully, but the soils react to some faster than to others. The amount

and type of amendment needed can be determined by laboratory analysis of soil samples, which indicates the amounts of sodium that must be replaced if the soil is to be improved.

An alternative to reclamation through the use of large quantities of gypsum is the seeding of salt- and sodium-tolerant grasses. Among these are tall wheatgrass, western wheatgrass, and alta fescue. These grasses can grow in soils that have relatively high concentrations of both soluble salts and sodium.

**Proper pasture management.** Proper pasture management includes adjusting stocking rates or the season of use so that the maximum growth and survival of high-quality grasses and legumes can be achieved. A common method is to rotate grazing among several pastures. This method allows adequate regrowth in each pasture. Livestock should be excluded when the pastures are wet. Allowing livestock to graze on wet pasture results in compaction of the soil, a decrease in the water intake rate, and deterioration of soil structure. Proper irrigation management and drainage help to keep the pastures in good condition. Increased yields can be obtained by applying commercial fertilizer and barnyard manure. Weeds generally can be controlled by mowing. The droppings of manure should be spread with a drag each spring.

### Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management can be obtained at the local office of the Soil Conservation Service. In any given year, yields may be higher or lower because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include reclamation, drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops

grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

## Rangeland

About 95 percent of the land in the survey area is rangeland. About 75 percent of the agricultural income is derived from livestock, principally cattle. Cow-calf operations are dominant, but cow-calf-yearling operations also are common. Most of the rangeland is administered by the Bureau of Land Management. The privately owned land is mainly near Battle Mountain along the Humbolt River and in the Reese River and Antelope Valleys. Ranches vary in size from about 5,000 acres to 230,000 acres.

On some ranches the forage produced on the rangeland is supplemented by aftermath grazing on hayland and small grain stubble fields in fall. In winter the native forage generally is supplemented by hay, but some areas of winter range are in the survey area.

For each map unit suitable for use as rangeland, a table in the section "Rangeland Plants and Woodland Understory" shows the grasses, forbs, and shrubs that make up the potential native plant community on each major soil and contrasting inclusion; the common plant name and plant symbol for the characteristic vegetation; the average percent composition for each species in the potential plant community; the range site symbol; and the total annual production of vegetation in favorable, normal, and unfavorable years. A more detailed ecological description of each range site, identified by symbol, is provided in a technical guide available in the local office of the Soil Conservation Service.

A *range site* is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, and proportion of range plants. The relationship between soils and vegetation was established during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table also are important.

*Potential production* is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it

is palatable to grazing animals. It includes the current year's growth of leaves, twigs, flowers, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight is the total annual yield per acre reduced to a common percent of air-dry moisture.

Characteristic vegetation—the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by *common plant name*. The expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals, the grazing season, and the availability of forage. Many plants, trees, and shrubs are inaccessible to foraging animals.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community for a given use.

Generally, the objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Grazing management should be at an intensity that maintains enough plant cover to protect the soil and that maintains or improves the quantity and quality of desirable vegetation. Proper management applies to all grazing animals, including livestock, game animals, and wild horses.

The most practical and efficient way to achieve good management of livestock grazing is with a planned grazing system. A good system is one in which two or

more grazing units are alternately rested from grazing in a planned sequence over a period of years. The rest period should extend at least through the growing season of the key plants. Using such a system ensures that the same unit is not grazed at the same time year after year.

Planned grazing systems should be designed to fit the individual operating unit but still meet management objectives. Using livestock watering developments, fencing, salting, or constructing livestock trails can help to achieve a better distribution of grazing.

Brush management is needed when the less desirable woody species increase beyond the natural proportions for the site. It can benefit both livestock and wildlife and can reduce sedimentation and improve watershed quality.

The use of chemicals is effective in brush management. When chemicals are properly applied in a timely manner, good results can be expected. The understory should include enough desirable plant species to respond to the treatment.

Prescribed burning is also effective in brush management. It is relatively inexpensive but requires precautions. Its success requires a good understory to provide fuel, and proper timing of the burning is critical. It is not so selective as chemical treatment.

Mechanical treatment practices, such as plowing, chaining, or beating, are effective on certain sites, but the cost is high.

Range seeding may be needed when the range has deteriorated to a point where desired plant species have disappeared or as critical area treatment following wildfire. Sites to be seeded should be evaluated on the basis of the soil, climate, topography, and planned use to determine the species that are adapted and the seeding techniques that can be used.

Even though adapted species and improved techniques are applied, successful seeding in this survey area is strongly influenced by rainfall. Precipitation fluctuates drastically from one year to the next, even in the areas that receive higher amounts of rainfall. The success of range seeding depends on the amount of moisture available during the growing season. Each soil is rated in the detailed map unit descriptions for planned range seeding. A plant cover should be maintained to prevent accelerated erosion on the soils that are poorly suited to seeding. The criteria used to develop the ratings are listed in the "Appendix."

*Range seeding* ratings are relative ratings that suggest the number of successful seeding establishments that might be expected during a given period of years. The ratings are not intended to be a measure of the total annual yield. Productivity is

dependent upon the interaction of most of the soil properties and characteristics that are considered. In addition, the number of plant species adapted to the soil decreases with decreasing soil suitability.

Successful seeding of depleted areas of rangeland in the survey area reduces the runoff rate and thus helps to control erosion. The soils that are best suited to seeding are moderately deep or deeper; receive adequate moisture and can retain it; are resistant to sheet, rill, and wind erosion; are free of salts and sodium; and have a medium textured upper layer that is relatively free of rock fragments and is resistant to crusting.

## Woodland Management

Woodland in this survey area is limited to small areas of singleleaf pinyon pine and Utah juniper. These sites are primarily on south- and west-facing mountain crests and side slopes. Elevations are 6,000 to 8,000 feet. The sites are on the Toiyabe, Shoshone, and Fish Creek Ranges as well as on Battle Mountain.

These sites are used mainly as wildlife habitat and for livestock understory grazing. A limited use is made of pinyon and juniper for fenceposts and firewood, but steep slopes limit access to most stands. Productivity of wood products is low.

The detailed soil map units can be used by woodland owners or forest managers in planning the use of soils for wood crops. In each map unit those soils suitable for wood crops are identified and the ordination (woodland suitability) symbol for each soil is listed. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excessive water in or on the soil; *T*, toxic substances in the soil; *D*, restricted root depth; *C*, clay in the upper part of the soil; *S*, sandy texture; and *F*, high content of coarse fragments in the soil profile. The letter *O* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: *R*, *X*, *W*, *T*, *D*, *C*, *S*, and *F*.

The potential productivity of common trees on a soil is expressed as a *site index*. This index is the basal area that dominant and codominant trees of a given species attain in a specified number of years. The site



index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

### Woodland Understory Vegetation

Understory vegetation consists of grasses, forbs, shrubs, and other plants. If well managed, some woodland can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter.

The total production of understory vegetation, indicated in the section "Rangeland Plants and Woodland Understory," includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4.5 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

### Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection. All windbreaks in the survey area require irrigation.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a commercial nursery.

### Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

Wildlife is a valuable resource in the survey area. It provides opportunities for outdoor activities, such as hunting and fishing.

Wildlife is a product of the soil. Like crops, wildlife responds to good management. Most managed wildlife habitat is created, improved, or maintained by planting suitable vegetation, by manipulating existing vegetation to bring about the natural establishment of desired plants, or by a combination of both. The habitat elements needed by specific species of wildlife generally require several kinds of soil and a combination of land uses.

In the detailed soil map unit descriptions, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat. The elements of wildlife habitat are described in the following paragraphs.

*Grain and seed crops* are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

*Grasses and legumes* are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, orchardgrass, brome grass, clover, and alfalfa.

*Wild herbaceous plants* are native or naturally established grasses and forbs, including weeds. Soil

properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are needlegrass, balsamroot, globemallow, wheatgrass, and bluegrass.

*Coniferous plants* furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are singleleaf pinyon and juniper.

*Shrubs* are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountainmahogany, bitterbrush, snowberry, and big sagebrush.

*Wetland plants* are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, reed canarygrass, saltgrass, cordgrass, rushes, sedges, and cattail.

*Shallow water areas* have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

## Recreation

Restrictive soil features such as wetness, slope, and texture of the surface layer are considered when evaluating a particular site for recreational development. Susceptibility to flooding is considered. The location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines should be considered. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

Camp areas, picnic areas, playgrounds, and paths and trails need special attention.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few if any stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

In Lander County, North Part, several areas have recreational potential. These vary from mountainous areas to valley bottoms. Outdoor recreation includes hunting, fishing, picnicking, riding, hiking, and rock and artifact hunting.

## Engineering

In the section "Detailed Soil Map Units," information for planning land uses related to urban development and to water management is provided. Soils are rated for various uses, and the most limiting features are identified. The ratings are given for the following selected uses: roadfill; topsoil; daily cover for landfill; shallow excavations; local roads and streets; pond reservoir areas; embankments, dikes, and levees; sand;

and gravel. For some soils the restrictive features that affect drainage, irrigation, and terraces and diversions also are given. More information can be obtained from local offices of the Soil Conservation Service.

*The information is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.*

*The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.*

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings. The criteria used to determine the ratings are provided in the "Appendix." During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreation uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the map unit descriptions, along with the soil maps, the taxonomic unit descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the "Glossary."

In the detailed map unit descriptions, the soils are rated for various uses and the most limiting features are identified. The ratings are based on observed performance of the soils and on the estimated data given in the map units and lab test data. The limiting features are defined in the "Glossary."

Soil interpretations are periodically updated as more is learned about a soil and its behavior under specific uses. New technology can change the relative suitability of a soil for various uses; however, the soil maps remain useful after the soil interpretations originally published with them have become outdated. For this reason, the criteria and guides that were used to make the interpretations presented in the detailed map units are provided in the "Appendix." These criteria have been taken directly from the "National Soils Handbook" (28).

The limitations for shallow excavations, local roads and streets, pond reservoir areas, and embankments, dikes, and levees are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

*Shallow excavations* are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

*Local roads and streets* have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of

the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

*Pond reservoir areas* hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

*Embankments, dikes, and levees* are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In the detailed map unit descriptions, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the upper layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

In the detailed map unit descriptions, the soils are rated for use as roadfill, topsoil, and daily cover for landfill.

*Roadfill* is soil material that is excavated in one place and used in road embankments in another place. The soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the upper layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a

high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. These soils may have layers of suitable material, but the material is less than 3 feet thick.

*Topsoil* is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The upper layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

*Daily cover for landfill* is the soil material that is used

to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The upper layer generally has the best workability, more organic matter, and the best potential for plants. Material from the upper layer should be stockpiled for use as the final cover.

The soils are rated as a probable or improbable source of *sand* and *gravel*. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the taxonomic unit descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a *probable* source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at

least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an *improbable* source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

In some of the detailed map unit descriptions, the restrictive features that affect drainage, irrigation, and terraces and diversions are listed.

*Drainage* is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

*Irrigation* is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

*Terraces and diversions* are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

# Soil Properties

---

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features are given in the section "Detailed Soil Map Units."

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties given in the map unit descriptions include the range of grain-size distribution, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

## Engineering Index Properties

Estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area are given in the "Typical Profile" in the detailed map unit descriptions and in Table 5 as described below. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

*Depth* to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27

percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the "Glossary."

*Classification* of the soils is determined according to the system adopted by the American Association of State Highway and Transportation Officials (1) and the Unified soil classification system (2).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

*Rock fragments* ranging from 2 millimeters in diameter to larger than 3 inches are indicated as a percentage of the total soil on a dry-weight basis. Cobbles and stones are larger than 3 inches in diameter, and pebbles are 2 millimeters to 3 inches in diameter. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. The estimates are rounded to the nearest 5 percent.

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The

sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit and plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

## Physical and Chemical Properties

Estimates of some characteristics and features that affect soil behavior are given in the detailed map unit descriptions. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

*Depth* to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

*Permeability* refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

*Available water capacity* refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in total inches of water for the soil profile. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

*Soil reaction* is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH

of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

*Salinity* is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the map unit descriptions. Salinity affects the suitability of a soil for rangeland seeding and crop production, the stability of the soil if used as construction material, and the potential of the soil to corrode metal and concrete.

*Sodicity* is a measure of exchangeable sodium in the soil at saturation. It is expressed as a sodium adsorption ratio (SAR), or the ratio of sodium to calcium plus magnesium. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The sodicity of irrigated soils is affected by the quality of irrigation water and management of the soil. Hence, the sodicity of soils in individual fields can differ greatly from the value given in the map unit descriptions. Sodicity affects the suitability of a soil for rangeland seeding and crop production and the stability of the soil if used as construction material.

*Shrink-swell potential* is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2

millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent.

*Erosion factor K* indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, very fine sand, sand, and organic matter (up to 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water. The estimate for the factor K is made only on the surface layer.

*Erosion factor T* is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

*Wind erodibility groups* are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of the soil surface to wind erosion. Soils are grouped according to the amount of stable aggregates 0.84 millimeters in size. These are represented idealistically by USDA textural classes. Soils containing rock fragments can occur in any group. The following paragraphs describe the groups by textural class:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to reestablish after cultivation.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.
4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly

erodible. Crops can be grown if measures to control wind erosion are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

The *hazard of erosion* is an estimate of erosion of the bare soil surface by water and wind. The hazard of erosion by water is determined on the basis of erosion factor K and percent slope. The hazard of erosion by wind is determined on the basis of the stability of the soil surface and the climate. The guidelines used in estimating the hazard of erosion are given in the "Appendix."

## Soil and Water Features

Estimates of various soil and water features are given in the detailed map unit descriptions. The estimates are used in land use planning that involves engineering considerations.

*Hydrologic soil groups* are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These



consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

*Flooding*, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

The frequency and duration of flooding and the time of year when flooding is most likely is given in the map unit descriptions.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

*High water table* (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. The depth to the seasonal high water table is indicated in the map unit descriptions. A water table that is seasonally high for less than 1 month is not indicated.

Only saturated zones within a depth of about 6 feet are indicated.

*Depth to bedrock* is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and

on observations during soil mapping.

*Cemented pans* are cemented or indurated subsurface layers within a depth of 5 feet. Such pans cause difficulty in excavation. Pans are classified as thin or thick. A *thin* pan is less than 3 inches thick if continuously indurated or less than 18 inches thick if discontinuous or fractured. Excavations can be made by trenching machines, backhoes, or small rippers. A *thick* pan is more than 3 inches thick if continuously indurated or more than 18 inches thick if discontinuous or fractured. Such a pan is so thick or massive that blasting or special equipment is needed in excavation.

*Potential frost action* is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

*Corrosivity* pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

In cooperation with  
United States Department  
of the Interior, Bureau of  
Land Management, and  
University of Nevada,  
Agricultural Experiment  
Station

# **Soil Survey of Lander County, Nevada, North Part (Volume II)**

# Classification of the Soils

---

The system of soil classification used by the National Cooperative Soil Survey has six categories (27). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 6 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

**ORDER.** Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Aridisol.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Orthid (*Orth*, meaning true, plus *id*, from Aridisol).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Camborthids (*Camb*, meaning change, plus *orthid*, the suborder of the Aridisols).

**SUBGROUP.** Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Camborthids.

**FAMILY.** Families are established within a subgroup

on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy-skeletal, mixed, mesic Typic Camborthids.

**SERIES.** The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

## Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (26). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (27). Unless otherwise stated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

### Akerue Series

The Akerue series consists of shallow, well drained soils that formed in residuum of weathered andesite,

rhyolite, and quartzite. Akerue soils are on low foothills. Slopes are 4 to 8 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid, shallow Xerollic Durargids

**Typical pedon:** Akerue very cobbly loam, 15 to 30 percent slopes, in an area of the Akerue-Simpark-Punchbowl association, in Lander County, south part:

A—0 to 3 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate medium and thick platy structure; slightly hard, very friable, sticky and plastic; few fine and many very fine roots; many very fine and fine vesicular pores; 10 percent pebbles, 25 percent cobbles, 2 percent stones; mildly alkaline (pH 7.4); clear smooth boundary. (3 to 6 inches thick)

Bt1—3 to 6 inches; pale brown (10YR 6/3) very cobbly clay loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; few thin clay films on faces of peds; 10 percent pebbles, 25 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (3 to 7 inches thick)

Bt2—6 to 15 inches; yellowish brown (10YR 5/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; moderate fine and medium angular blocky structure; hard, firm, very sticky and very plastic; common very fine and fine roots; few very fine and fine tubular pores; many thick pressure faces on peds; 10 percent pebbles, 35 percent cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (4 to 9 inches thick)

Bqkm—15 to 21 inches; very pale brown (10YR 8/4) indurated duripan containing many bedrock fragments and cemented with several continuous laminar layers; light yellowish brown (10YR 6/4) moist; massive; extremely hard; few fine roots in some fractures; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (0.5 inch to 6 inches thick)

R—21 inches; andesite.

**Type location:** Lander County, Nevada, south part; about 18 miles east of Austin, approximately 500 feet north and 1,500 feet west of the southeast corner of sec. 31, T. 18 N., R. 47 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 44 to 47 degrees F

**Depth to duripan:** 14 to 20 inches

**Depth to bedrock:** 15 to 26 inches

**Control section:** Clay content—35 to 45 percent; content of rock fragments—35 to 60 percent, mostly cobbles and stones

**Reaction of A and Bt horizons:** Neutral or mildly alkaline, becoming more alkaline with depth

**Other features:** Silica and lime pendants on rock fragments in the lower part of the Bt horizon in some pedons

**A horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

**Bt horizon:**

Hue—7.5YR or 10YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—very cobbly clay loam, very cobbly clay, or extremely cobbly clay loam

### Alley Series

The Alley series consists of very deep, well drained soils that formed in loess over alluvium and colluvium derived from mixed andesite, basalt, and tuff that has some influence from loess. Alley soils are on side slopes of foothills. Slopes are 15 to 75 percent. Mean annual precipitation is about 8 inches, and mean annual air temperature is about 49 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Alley loam, 30 to 50 percent slopes, in an area of the Burrita-Alley-Newpass association:

A—0 to 3 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak very thin platy structure; soft, very friable, sticky and slightly plastic; many fine and very fine and few medium roots; many fine vesicular pores; 10 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 8 inches thick)

Bt1—3 to 7 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and very fine and few medium roots; common very fine tubular pores; 15 percent pebbles; common thin clay films on faces of peds; mildly alkaline (pH 7.8); clear smooth boundary. (3 to 6 inches thick)

Bt2—7 to 16 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure;

hard, firm, sticky and plastic; few fine and medium roots; common very fine tubular pores; 20 percent pebbles; common thin clay films on faces of peds; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 9 inches thick)

**Bqk**—16 to 26 inches; very pale brown (10YR 7/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; hard, firm, nonsticky and nonplastic; common very fine and few fine roots; common very fine tubular pores; 20 percent pebbles; lime coatings on pebbles; weak continuous silica and lime cementation; slightly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 10 inches thick)

**Bk1**—26 to 40 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; 30 percent pebbles; lime coating on pebbles; strongly effervescent and very strongly effervescent with disseminated lime; strongly alkaline (pH 8.6); gradual wavy boundary. (6 to 10 inches thick)

**Bk2**—40 to 60 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, brown (7.5YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine tubular pores; 50 percent pebbles, 5 percent cobbles; lime coatings on rock fragments; violently effervescent with disseminated lime; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 12 miles north of Battle Mountain, approximately 1,200 feet south and 2,500 feet west of the northeast corner of sec. 14, T. 33 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to weakly silica- and lime-cemented strata:** 16 to 30 inches

**Depth to carbonates:** 16 to 22 inches

**Reaction:** Mildly alkaline to strongly alkaline, becoming more alkaline with depth

**Other features:** Few to many, fine to coarse lime segregations in most pedons where depth to the Bqk horizon is more than 22 inches

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak or moderate, very thin to thick platy; massive in some pedons

Reaction—neutral or mildly alkaline

Other features—when mixed, the uppermost 7 inches has color values greater than 5.5 dry and 3.5 moist

#### Bt horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 to 4

Texture—gravelly loam, gravelly clay loam, or gravelly sandy clay loam

Clay content—20 to 30 percent

Rock fragments—15 to 30 percent, mainly pebbles

Structure—weak or moderate, fine to coarse subangular blocky

Reaction—mildly alkaline or moderately alkaline

#### Bqk horizon:

Value—6 to 8 dry, 4 to 6 moist

Chroma—1 to 4

Texture—gravelly fine sandy loam, gravelly sandy loam, or cobbly fine sandy loam

Rock fragments—15 to 35 percent, mainly pebbles or cobbles

Consistence—hard or very hard

Reaction—moderately alkaline or strongly alkaline

Silica cementation—few thin or very thin

discontinuous silica laminae in some pedons;

durinodes in a friable matrix below the weakly cemented horizons in some pedons

#### 2Bk horizon (not in all pedons):

Rock fragments—40 to 60 percent when mixed, mostly pebbles and cobbles, few stones in some pedons

### Allor Series

The Allor series consists of very deep, well drained soils formed in alluvium weathered from mixed rock sources. Allor soils are on fan piedmont remnants. Slopes are 4 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Allor gravelly loam, 4 to 15 percent slopes, in an area of the Zaidy-Allor association, in Lander County, south part. Pebbles cover 30 percent of the soil surface:

**A1**—0 to 6 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.8);

abrupt smooth boundary. (3 to 7 inches thick)

A2—6 to 12 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (0 to 6 inches thick)

Bt—12 to 19 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; many very fine and fine roots; common very fine and fine tubular pores; few thin clay films coating peds; 15 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (3 to 7 inches thick)

Btq—19 to 34 inches; pale brown (10YR 6/3) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; common very fine and fine tubular pores; few moderately thick and common thin clay films coating peds; 25 percent pebbles; 15 percent weakly cemented durinodes; mildly alkaline (pH 7.8); clear smooth boundary. (8 to 15 inches thick)

Bq1—34 to 42 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; massive; very hard, firm, nonsticky and nonplastic; few fine roots; few fine tubular pores; 25 percent pebbles, 5 percent cobbles; weak continuous silica cementation; mildly alkaline (pH 7.8); clear smooth boundary. (6 to 16 inches thick)

Bq2—42 to 60 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; massive; very hard, firm, nonsticky and nonplastic; 50 percent pebbles, 5 percent cobbles; weak silica cementation; slightly effervescent; moderately alkaline (pH 8.3).

**Type location:** Lander County, Nevada, south part; about 10 miles northeast of Austin, approximately 650 feet south and 2,400 feet west of the northeast corner of sec. 21, T. 20 N., R. 45 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 50 degrees F

**Combined A and Bt horizons:** 20 to 34 inches

**Depth to Bq horizon:** 20 to 34 inches

**Depth to carbonates:** 40 to more than 60 inches

**Control section:** Texture—clay loam or sandy clay loam; clay content—27 to 35 percent; content of rock fragments—15 to 35 percent, mainly pebbles

**Reaction:** Mildly alkaline or moderately alkaline, generally becoming more alkaline with depth  
**Other features:** A BA or Bqk horizon in some pedons

#### A horizon:

Value—3 or 4 moist

Chroma—2 or 3

#### Bt horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Cementation—as much as 15 percent durinodes in the lower part of the Bt horizon in most pedons

#### Bq and Bqk horizons:

Value—5 to 7 dry, 4 or 5 moist

Chroma—3 or 4

Cementation—weak continuous cementation; noncemented strata in some pedons

Texture—loamy sand or sandy loam

Rock fragments—20 to 60 percent, mainly pebbles

### Alyan Series

The Alyan series consists of moderately deep, well drained soils that formed in residuum and colluvium derived from igneous rocks and siliceous tuff. Alyan soils are on crests and shoulders of mountains. Slopes are 4 to 15 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Alyan gravelly loam, 4 to 15 percent slopes, in an area of the Alyan-Graley-Rock outcrop association. Pebbles cover 20 percent and cobbles 5 percent of the soil surface:

A1—0 to 2 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; strong very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many common very fine vesicular pores; 25 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 3 inches thick)

A2—2 to 5 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; strong very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine and few fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (3 to 9 inches thick)

A3—5 to 10 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure;

slightly hard, friable, sticky and plastic; common very fine and few fine and medium roots; common very fine and few fine and medium tubular pores; 5 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (3 to 8 inches thick)

**Bt1**—10 to 16 inches; brown (10YR 5/3) clay, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; common very fine and few fine and medium roots; common very fine and few fine and medium tubular pores; few thin clay films on faces of peds and pores; 10 percent pebbles and 2 percent cobbles; mildly alkaline (pH 7.6); clear wavy boundary. (3 to 8 inches thick)

**Bt2**—16 to 20 inches; light gray (10YR 7/2) gravelly clay, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; few very fine, fine, and medium roots; common very fine and few fine and medium tubular pores; common thin clay films on faces of peds and pores; 25 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (4 to 18 percent inches thick)

**Bt3**—20 to 24 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium and coarse subangular blocky structure; extremely hard, extremely firm, very sticky and very plastic; few very fine expd roots; few very fine tubular pores; continuous moderately thick clay films on faces of peds and pores; 10 percent pebbles, 2 percent cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (0 to 5 inches thick)

**R**—24 inches; hard, unweathered rhyolite.

**Type location:** Lander County, Nevada; about 25 miles north of Battle Mountain, approximately 1,900 feet north of the southeast corner of sec. 14, T. 36 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 44 to 47 degrees F

**Mollic epipedon thickness:** 8 to 18 inches, includes the upper part of the argillic horizon

**Depth to bedrock:** 20 to 40 inches

**Thickness of the A and Bt horizons:** 20 to 40 inches

**Control section:** Clay content—40 to 55 percent; content of rock fragments—averages 15 to 35 percent, mainly pebbles

#### A horizon:

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—platy or subangular blocky

Reaction—neutral or mildly alkaline

#### Bt horizon:

Hue—10YR or 7.5YR

Value—5, 6, or 7 dry, 3, 4, or 5 moist; darker values are common only in the upper part of the horizon

Chroma—2, 3, or 4

Texture—clay or gravelly clay that has thin subhorizons of very gravelly clay overlying the bedrock in most pedons and thin gravelly clay loam subhorizons in some pedons

Structure—subangular blocky; massive in some pedons

Reaction—neutral or mildly alkaline

### Antel Series

The Antel series consists of very deep, moderately well drained soils that formed in silty alluvium derived from mixed sediments, mostly of volcanic rocks, tuff, loess, and volcanic ash. Antel soils are on fan skirts and stream terraces. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Duric Camborthids

**Typical pedon:** Antel silt loam, 0 to 2 percent slopes:

**A**—0 to 5 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; strong coarse and very coarse prismatic structure parting to moderate thin and medium platy; slightly hard, very friable, slightly sticky and plastic; few very fine roots; many very fine vesicular, interstitial, and tubular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 8 inches thick)

**Bw**—5 to 11 inches; very pale brown (10YR 7/3) silt loam, dark yellowish brown (10YR 4/4) moist; strong thin and medium platy structure; slightly hard, very friable, slightly sticky and plastic; common very fine and few fine and medium roots; many very fine interstitial and tubular pores; moderately alkaline (pH 8.4); clear irregular boundary. (5 to 12 inches thick)

**Bq**—11 to 16 inches; very pale brown (10YR 7/3) silty clay loam, brown (10YR 4/3) moist; moderate medium platy structure; hard, very friable, sticky and plastic; common very fine and few fine and medium roots; common very fine interstitial and tubular pores; 30 percent 10- to 30-millimeter, weak and moderately strong durinodes; moderately alkaline (pH 8.2); gradual wavy boundary. (0 to 6 inches thick)

**2Bq**—16 to 25 inches; white (10YR 8/2) very fine sandy loam (dominantly volcanic ash), yellowish brown

(10YR 5/4) moist; few fine faint brown (10YR 4/3 moist) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; 30 percent 10- to 20-millimeter, weak and moderately strong durinodes; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 9 inches thick)

3Bqk1—25 to 37 inches; grayish brown (10YR 5/2) silty clay loam, brown (10YR 4/3) moist; common fine faint yellowish brown (10YR 5/4 moist) and dark yellowish brown (10YR 4/4 moist) mottles; moderate medium prismatic structure that parts to weak fine angular blocky; slightly hard, very friable, sticky and very plastic; few very fine and fine roots; common very fine tubular pores; 20 percent 10- to 20-millimeter, weak and moderately strong durinodes; common fine white (10YR 8/1) lime filaments that are strongly effervescent; strongly alkaline (pH 9.0); gradual wavy boundary. (10 to 16 inches thick)

3Bqk2—37 to 60 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 3/3) moist; common fine distinct dark yellowish brown (10YR 4/4 moist) and faint very dark grayish brown (10YR 3/2 moist) mottles; moderate medium prismatic structure that parts to moderate fine angular blocky; hard, very friable, sticky and very plastic; few very fine and fine roots; common very fine tubular pores; 10 percent 10- to 20-millimeter, weak and moderately strong durinodes; few very dark gray (10YR 3/1) and black (10YR 2/1 moist) iron and manganese streaks; few fine white (10YR 8/1) filaments and soft masses of lime; slightly effervescent matrix; violently effervescent segregated lime; strongly alkaline (pH 8.6); clear smooth boundary. (10 to 25 inches thick)

3Bk—60 to 66 inches; very pale brown (10YR 7/3) silt loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, slightly sticky and plastic; many very fine tubular pores; 5 percent 2- to 10-millimeter, rounded and subrounded pebbles; few fine white (10YR 8/2) and very pale brown (10YR 7/3 moist) lime filaments; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; approximately 39 miles southwest of Battle Mountain, about 1,000 feet east and 160 feet north of the southwest corner of sec. 20, T. 26 N., R. 43 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, but some pedons are moist in some part for short periods from October through May

**Soil temperature:** 47 to 53 degrees F

**Depth to Bq horizon:** 11 to 20 inches

**Control section:** Clay content—27 to 35 percent; texture—very fine sandy loam, silt loam, silty clay loam, or silty clay, averaging silty clay loam; content of rock fragments—0 to 5 percent pebbles

**Reaction:** Moderately alkaline or strongly alkaline

**Salt and sodium:** Moderately or strongly affected below a depth of 20 to 30 inches and slightly affected above; moderately sodium affected in the upper part of some pedons

**Other features:** Below a depth of 20 inches in some pedons, a horizon, less than 5 inches thick, that is 10 percent weakly discontinuously silica and carbonate cemented; faint or distinct relict iron mottles are common in any horizon below a depth of 16 inches

#### A horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2, 3, or 4

Structure—platy or prismatic

Other features—noneffervescent in some pedons

#### Bw horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2, 3, or 4

Structure—platy or prismatic

#### Bq horizon:

Hue—10YR or 2.5Y

Value—5, 6, 7, or 8 dry, 3, 4, or 5 moist

Chroma—2, 3, or 4

Structure—prismatic parting to angular blocky; platy; massive in some pedons

Consistence—slightly hard or hard dry, slightly sticky or sticky and slightly plastic or plastic wet

Effervescence—slightly effervescent to violently effervescent

Cementation—20 to 40 percent weakly or strongly silica-cemented durinodes

#### Bqk horizon:

Hue—10YR or 2.5Y

Value—5, 6, 7, or 8 dry, 3, 4, or 5 moist

Chroma—2, 3, or 4

Structure—prismatic parting to angular blocky or platy; massive in some pedons

Consistence—slightly hard or hard dry, slightly sticky or sticky and slightly plastic or plastic wet

Effervescence—slightly effervescent to violently effervescent

Cementation—10 to 20 percent weakly to strongly silica-cemented durinodes



## Argenta Series

The Argenta series consists of very deep, somewhat poorly drained soils that formed in loamy alluvium derived from mixed rock sources high in content of pyroclastic materials. Argenta soils are on alluvial flats and remnant flood plains. Slopes are 0 to 4 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Argenta very fine sandy loam, 0 to 2 percent slopes:

A1—0 to 3 inches; light brownish gray (10YR 6/2) very fine sandy loam, brown (10YR 5/3) moist; weak thin and medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; slightly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (3 to 6 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and plastic; common very fine and few fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (0 to 4 inches thick)

BA—7 to 12 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and fine tubular pores; 5 percent pebbles; 10 percent very weak, 10- to 20-millimeter durinodes; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (4 to 6 inches thick)

Bqk1—12 to 24 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and very few fine tubular pores; 10 percent pebbles; 25 percent weak, 5- to 25-millimeter durinodes; common fine segregated lime filaments; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (10 to 20 inches thick)

Bqk2—24 to 45 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 4/3) moist; few fine distinct brown (7.5YR 4/4 moist) mottles; massive; slightly hard, friable, nonsticky and slightly plastic; few very fine roots; common very fine tubular pores; 10 percent pebbles; 25 percent weak and moderately strong, 15- to 25-millimeter durinodes; common fine segregated lime filaments; violently

effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (15 to 25 inches thick)

2C—45 to 60 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; common fine distinct reddish brown (5YR 4/4 moist) mottles; massive; soft, very friable, nonsticky and slightly plastic; few very fine roots; common very fine tubular pores; 30 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; approximately 1.7 miles east of Battle Mountain, about 1,850 feet south and 125 feet west of the approximate northeast corner of sec. 1, T. 32 N., R. 45 E.

### Range in Characteristics

**Soil moisture:** A seasonal water table at a depth of 32 to 40 inches for periods from February through July

**Soil temperature:** 47 to 52 degrees F

**Depth to Bqk horizon:** 12 to 24 inches

**Control section:** Clay content—8 to 18 percent; content of rock fragments—up to 15 percent pebbles; texture—very fine sandy loam or fine sandy loam that is 15 to 40 percent fine sand or coarser

**Reaction throughout the profile:** Moderately alkaline to very strongly alkaline

**Relict mottles:** In the upper part of some pedons

**Salt and sodium:** Slightly to strongly salt and strongly sodium affected to a depth of 24 to 30 inches, the degree decreasing with depth; percentage of exchangeable sodium ranges from 15 to 70 in half or more of the upper 15 inches and decreases with depth

**Other features:** Unconformable strata of loamy fine sand, fine sand, gravelly or very gravelly sand, or very coarse sand below a depth of 40 inches in some pedons

**A horizon:**

Value—6 to 8 dry, 4 or 5 moist

Chroma—2 or 3

Reaction—strongly alkaline or very strongly alkaline

**Bqk horizon:**

Hue—10YR or 7.5YR

Value—6 to 8 dry, 4 or 5 moist

Chroma—2 to 4

Texture—very fine sandy loam, fine sandy loam, silt loam, or loam

Other features—15 to 70 percent durinodes in a friable matrix

## Atlow Series

The Atlow series consists of shallow, well drained

soils formed in residuum derived from chert, argillite, shale, and altered rhyolitic tuff. Atlow soils are on summits and side slopes of mountains and hills. Slopes are 8 to 50 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Atlow very gravelly loam, 15 to 50 percent slopes, in an area of the Atlow-Stingdorn association, in Lander County, south part. Pebbles cover 40 percent and cobbles 10 percent of the soil surface:

A—0 to 3 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular pores; 25 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 5 inches thick)

Bt1—3 to 7 inches; pale brown (10YR 6/3) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine interstitial pores; 25 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 5 inches thick)

Bt2—7 to 14 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate angular blocky structure; hard, friable, very sticky and very plastic; common very fine and fine roots; common very fine interstitial and few tubular pores; 30 percent pebbles, 15 percent cobbles; few thin lime coatings on undersides of coarse fragments; moderately alkaline (pH 8.0); abrupt irregular boundary. (6 to 11 inches thick)

R—14 inches; chert; thin lime coatings in rock fractures.

**Type location:** Lander County, Nevada, south part; about 30 miles southwest of Battle Mountain, approximately 1,200 feet east and 1,050 feet north of the southwest corner of sec. 1, T. 29 N., R. 43 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 48 to 52 degrees F

**Solum thickness:** 14 to 20 inches

**Depth to bedrock:** 14 to 20 inches

**Control section:** Fine-earth texture—clay loam; clay content—27 to 35 percent

#### A horizon:

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 or 3

Reaction—mildly alkaline or moderately alkaline

#### Bt horizon:

Value—5, 6, or 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture—very gravelly clay loam or very cobbly clay loam

Rock fragments—35 to 50 percent, dominantly pebbles and cobbles

Structure—angular blocky, subangular blocky

Reaction—moderately alkaline or strongly alkaline

Carbonates—noncalcareous matrix; thin lime coatings on the underside of rock fragments

### Attella Series

The Attella series consist of very shallow, well drained soils that formed in residuum and colluvium derived from dolostone, dolomite, and calcareous shales with additions of loess. Attella soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), frigid Lithic Xeric Torriorthents

**Typical pedon:** Attella very gravelly loam, 30 to 50 percent slopes, in an area of the Hymas-Xine-Attella association, in Lander County, south part. Pebbles cover 80 percent and flagstones 5 percent of the soil surface:

A—0 to 3 inches; light brownish gray (10YR 6/2) very gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine vesicular and interstitial pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 5 inches thick)

C—3 to 7 inches; light brownish gray (10YR 6/2) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and many medium roots; common very fine and fine tubular pores; 45 percent pebbles; common thin lime coatings on undersides of pebbles, few pendants; strongly effervescent; moderately alkaline (pH 8.3); abrupt wavy boundary. (4 to 6 inches thick)

2R—7 inches; hard, fractured dolostone.

**Type location:** Lander County, Nevada, south part; approximately 12 miles north of Austin, about 2,100 feet north and 2,000 feet east of the southwest corner of sec. 26, T. 21 N., R. 44 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

*Soil moisture:* Usually moist, dry from mid-June through mid-October

*Soil temperature:* 41 to 47 degrees F

*Depth to bedrock:* 6 to 10 inches

*Carbonate equivalent:* 5 to 20 percent

*Control section:* Clay content—15 to 25 percent when mixed; texture—very gravelly loam or very gravelly silt loam; content of rock fragments—35 to 60 percent when mixed, mainly pebbles and some channers

*Reaction throughout the profile:* Mildly alkaline or moderately alkaline

*Organic carbon:* 1.0 to 2.5 percent when mixed

#### A horizon:

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak or moderate, thin or medium platy or granular

Consistence—friable or very friable moist

#### C horizon:

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2, 3, or 4

Structure—fine or medium subangular blocky; massive in some pedons

Consistence—soft or slightly hard dry, friable or very friable moist

Effervescence—strongly effervescent or violently effervescent

Segregated lime—lime coatings on undersides of rock fragments, soft masses of lime in some pedons

### Batan Series

The Batan series consists of very deep, moderately well drained soils that formed in silty alluvium derived from mixed rock sediments of mostly volcanic origin that are high in content of loess and pyroclastic materials. Batan soils are on stream terraces, flood plains, and alluvial flat remnants. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Durorthidic Torriorthents

**Typical pedon:** Batan silt loam, 0 to 2 percent slopes:

A—0 to 5 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; strong very thin platy structure; hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many vesicular and few very fine interstitial and tubular pores; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (2 to 6 inches thick)

C—5 to 9 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate very thin and thin and strong very thick platy structure; hard, very friable, slightly sticky and plastic; common very fine roots; many very fine interstitial and tubular pores; violently effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (0 to 8 inches thick)

Cq—9 to 19 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; many very fine tubular pores; 30 percent 5- to 15-millimeter, hard, firm, brittle durinodes; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (0 to 16 inches thick)

Cqk1—19 to 30 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; few fine faint brown (7.5YR 5/4 moist) and dark brown (7.5YR 4/4 moist) mottles; weak very thin platy structure; slightly hard, very friable, sticky and plastic; few very fine and few fine roots; many very fine interstitial and tubular pores; 20 percent 5- to 15-millimeter, hard, firm, brittle durinodes; fine white (10YR 8/2) filaments or threads of secondary carbonates; violently effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (6 to 13 inches thick)

Cqk2—30 to 44 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; common fine distinct light brown (7.5YR 6/4 moist) and dark yellowish brown (10YR 4/4 moist) mottles; strong medium platy structure parting to moderate very fine angular blocky; hard, friable, slightly sticky and plastic; few very fine, fine, and medium roots; common very fine tubular pores; 20 percent 5- to 15-millimeter, hard, firm, brittle durinodes; fine white (10YR 8/2) filaments or threads of secondary carbonates; violently effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (7 to 16 inches thick)

Cqk3—44 to 63 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; many fine distinct brown (7.5YR 4/4) and dark reddish brown (5YR 3/2) mottles, brown (7.5YR 4/2) and dark reddish brown (5YR 2/4) moist; moderate very thin

and thin platy structure parting to moderate very fine angular blocky; hard, friable, sticky and plastic; few very fine and fine roots; many very fine interstitial and few fine tubular pores; 20 percent 5- to 15-millimeter, hard, firm, brittle durinodes; fine white (10YR 8/1) filaments or threads of secondary carbonates; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (8 to 18 inches thick)

**C'**—63 to 68 inches; very pale brown (10YR 7/3) silt loam, dark grayish brown (2.5Y 4/2) moist; common fine faint pinkish gray (7.5YR 6/2 moist) and distinct brown (7.5YR 4/2 moist) mottles; massive; hard, friable, slightly sticky and plastic; few fine roots; many very fine interstitial and tubular pores; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; approximately 6.2 miles southeast of Battle Mountain, about 1,585 feet west and 1,585 feet north of the approximate southeast corner of sec. 31, T. 32 N., R. 46 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 53 degrees F

**Depth to Cq horizon:** 9 to 24 inches

**Control section:** Clay content—20 to 30 percent; texture—silt loam, silty clay loam; but may be stratified fine sandy loam to silty clay

**Salt and sodium:** Salt and sodium affected in most pedons; no salt and sodium in the upper horizons of some pedons near drainageways and stream channels

**Mottles:** Faint or distinct iron mottles are common in any horizon below a depth of 10 inches

**Gypsum:** Gypsum crystals below a depth of 20 inches in some pedons

**2C horizon (where present):** Unconformable stratified very gravelly sands and fine sands below a depth of 50 inches in some pedons

#### A horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—platy; massive in some pedons

Consistence—slightly hard or hard, slightly sticky or sticky, and slightly plastic or plastic

Reaction—moderately alkaline to very strongly alkaline

Other features—slightly effervescent to violently effervescent

#### C horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—platy, angular blocky, prismatic; massive in some pedons

Reaction—strongly alkaline or very strongly alkaline

Other features—strongly effervescent or violently effervescent

#### Cq and Cqk horizons:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Cementation—20 to 40 percent durinodes; as much as 70 percent weak discontinuous silica cementation in subhorizons of some pedons

### Belate Series

The Belate series consists of very deep, well drained soils that formed in colluvium and residuum weathered from rhyolitic tuff and andesite. Belate soils are on convex side slopes of mountains. Slopes are 30 to 75 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic Argixerolls

**Typical pedon:** Belate very gravelly loam, 15 to 30 percent slopes, in an area of the Belate-Softscrabble-Torro association, in Lander County, south part. Pebbles cover 65 percent and cobbles and stones 15 percent of the soil surface:

**A1**—0 to 4 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; common very fine vesicular pores; 40 percent pebbles, 5 percent cobbles; neutral (pH 7.2); clear smooth boundary. (1 to 4 inches thick)

**A2**—4 to 14 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, fine, and medium roots; many very fine and few medium tubular pores; 30 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary. (4 to 10 inches thick)

**Bt1**—14 to 19 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; few thin clay films on peds; 35 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); gradual wavy boundary. (5 to 7 inches thick)

**Bt2**—19 to 47 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; strong medium angular blocky structure; hard, friable, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; 40 percent pebbles; common moderately thick and many thin clay films on peds; 35 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.6); gradual wavy boundary. (10 to 28 inches thick)

**Bt3**—47 to 60 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; hard, friable, very sticky and very plastic; few very fine roots; few very fine tubular pores; few moderately thick and common thin clay films on faces of peds; 40 percent pebbles, 15 percent cobbles; noneffervescent matrix; few thin lime coatings on undersides of rock fragments; mildly alkaline (pH 7.8).

**Type location:** Lander County, Nevada, north part; about 32 miles west of Austin, approximately 1,000 feet west and 700 feet north of the apparent southeast corner of sec. 15, T. 17 N., R. 38 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-July through October; in most years the moisture distribution limits depth of wetting to about 15 to 20 inches

**Soil temperature:** 43 to 47 degrees F

**Mollic epipedon thickness:** 10 to 20 inches, includes the upper part of the argillic horizon

**Solum thickness and depth to bedrock:** 60 to 80 inches

**Control section:** Clay content—18 to 30 percent; content of rock fragments—35 to 50 percent, mainly pebbles

**Reaction throughout the profile:** Neutral or mildly alkaline

#### A horizon:

Value—4 or 5 dry, 2 or 3 moist

Chroma—1, 2, or 3 dry or moist

Structure—weak or moderate, fine or medium subangular blocky or thin or medium platy

#### Bt horizon:

Value—5 or 6 dry, 2, 3, or 4 moist

Chroma—3 or 4

Texture—very gravelly loam or very gravelly clay loam

Clay content—18 to 30 percent

Rock fragments—35 to 60 percent, mainly pebbles

Structure—fine or medium subangular blocky or

angular blocky; Bt3 horizon massive in some pedons

### Beoska Series

The Beoska series consists of very deep, well drained soils that formed in loess over loamy and gravelly alluvium derived from mixed sources. Beoska soils are on fan piedmonts and fan piedmont remnants. Slopes are 0 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Natrargids

**Typical pedon:** Beoska silt loam, 0 to 2 percent slopes:

**A1**—0 to 5 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate very thin and thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine and few fine roots; many vesicular and very fine tubular pores; 20 percent pebbles on immediate surface; moderately alkaline (pH 8.0); clear wavy boundary. (4 to 7 inches thick)

**A2**—5 to 9 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium and coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; common very fine tubular pores; less than 2 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 6 inches thick)

**AB**—9 to 13 inches; mottled very pale brown (10YR 7/2) and light gray (10YR 7/3) silt loam, brown (10YR 4/3) moist; weak coarse prismatic structure; hard, friable, slightly sticky and plastic; few very fine and very few fine roots; many very fine tubular pores; less than 2 percent pebbles; strongly alkaline (pH 8.6); abrupt wavy boundary. (0 to 10 inches thick)

**Btn**—13 to 18 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 3/3) moist; weak medium and coarse prismatic structure parting to moderate very fine and fine angular blocky; hard, very friable, sticky and very plastic; many very fine and fine roots; common very fine tubular pores; many thin clay films on peds and lining pores; 5 percent 2- to 15-millimeter, rounded pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear irregular boundary. (4 to 13 inches thick)

**Btnk**—18 to 24 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist;

weak medium and coarse prismatic structure parting to moderate very fine and fine angular blocky; hard, friable, slightly sticky and plastic; many very fine and fine roots; common very fine tubular pores; many thin clay films on peds and in pores; common fine filaments and threads of secondary carbonates and coatings on pebbles; 5 percent 2- to 15-millimeter, rounded pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (0 to 8 inches thick)

**2Bqk**—24 to 55 inches; light gray (10YR 7/2) gravelly very fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and slightly plastic; few very fine roots; common very fine tubular pores; common fine filaments of secondary carbonates; 25 percent 5- to 15-millimeter, weak and moderate durinodes; 40 percent 2- to 15-millimeter, rounded pebbles; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; approximately 50 miles southwest of Battle Mountain, about 2,200 feet east and 1,200 feet north of the southwest corner of sec. 26, T. 25 N., R. 42 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to 2Bqk horizon:** 16 to 26 inches

#### A horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry

Chroma—2 or 3

Structure—platy, prismatic, or massive

#### Btn horizon:

Value—6 or 7 dry, 3 or 4 moist

Chroma—3 or 4

Texture—silty clay loam, silt loam, or clay loam

Clay content—25 to 35 percent

Rock fragments—up to 15 percent, mainly pebbles

Reaction—moderately alkaline or strongly alkaline

Other features—secondary carbonates in some subhorizons

#### Bqk horizon:

Value—7 or 8 dry, 4 to 6 moist

Texture—very fine sandy loam, fine sandy loam, sandy loam

Clay content—5 to 15 percent

Rock fragments—15 to 35 percent above 40 inches, 15 to 65 percent below 40 inches, mainly pebbles

Consistence—soft to hard dry, very friable to firm moist

Reaction—moderately alkaline or strongly alkaline

Other features—either 20 to 40 percent durinodes in a friable matrix or weak or strong discontinuous silica cementation

### Beowawe Series

The Beowawe series consists of very deep, well drained soils that formed in loess over loamy alluvium derived from mixed rock sources. Beowawe soils are on fan piedmont remnants. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Natrargids

#### Typical pedon: Beowawe silt loam:

**A**—0 to 6 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate very thin platy; slightly hard, very friable, nonsticky and slightly plastic; common very fine random roots; many very fine vesicular and few very fine tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (2 to 6 inches thick)

**Btn**—6 to 11 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and plastic; many very fine random and few fine oblique and horizontal roots; common very fine tubular pores; strongly alkaline (pH 8.6); abrupt wavy boundary. (5 to 11 inches thick)

**2Bqk1**—11 to 16 inches; very pale brown (10YR 8/3) very fine sandy loam, brown (10YR 4/3) and yellowish brown (10YR 5/4) moist; moderate thin and medium platy structure; hard, firm, nonsticky and slightly plastic; many very fine random and very few very fine oblique expd roots; few very fine interstitial and tubular pores; common fine segregated lime in filaments and threads along faces of peds; weak silica cementation; violently effervescent; strongly alkaline (pH 8.8); clear irregular boundary. (5 to 12 inches thick)

**2Bqk2**—16 to 29 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and plastic; very few very fine random roots; few very fine tubular pores; about 30 percent 2- to 10-millimeter, moderately strong durinodes; silica coatings bridging sand grains; common fine white (10YR 8/1) and very pale brown (10YR 7/3 moist) lime filaments and threads; violently effervescent; strongly alkaline (pH 8.8); clear irregular boundary. (5 to 14 inches thick)

**2Bqk3**—29 to 33 inches; very pale brown (10YR 7/3) loam, brown (10YR 4/3) moist; massive; hard,

friable, slightly sticky and slightly plastic; very fine random roots; very fine tubular pores; about 25 percent 2- to 10-millimeter, weak and moderately strong durinodes; common fine lime filaments and threads; gypsum concretions; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 14 inches thick)

**2Bqk4**—33 to 60 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; very few very fine random and very few fine oblique roots; few very fine tubular pores; about 25 percent 2- to 10-millimeter, weak and moderately strong durinodes; few fine lime filaments or threads; gypsum concretions; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 8 miles east of Battle Mountain, approximately 1,580 feet east and 400 feet south of the northwest corner of sec. 33, T. 32 N., R. 46 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in some part for short periods from November through June

**Soil temperature:** 47 to 53 degrees F

**Depth to base of the Btn horizon:** 11 to 24 inches

**Depth to continuous weakly cemented Bqk horizon:** 11 to 24 inches

**Control section:** Clay content—18 to 25 percent; texture—silt loam or loam; content of rock fragments—up to 20 percent, mainly pebbles; exchangeable sodium—15 to 35 percent

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—weak or moderate platy or prismatic; or massive

Other features—effervescent in some pedons because of recharge from calcareous dust

#### Btn horizon:

Hue—10YR or 7.5YR

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—weak or moderate prismatic or columnar that parts to weak or moderate, fine to coarse angular blocky or subangular blocky

Other features—slightly effervescent in the lower part of the horizon in some pedons; few to common, fine and medium secondary carbonate segregations in some pedons

#### 2Bqk horizon:

Value—5 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Texture—loam, very fine sandy loam, or loamy sand

Consistence—hard or very hard dry, friable or firm moist

Reaction—strongly alkaline or very strongly alkaline

Lime and silica—common to many, coarse to very coarse white lime coatings on very thin discontinuous silica laminae; 20 to 40 percent brittle durinodes in friable subhorizons

Other features—pockets and thin strata of slightly hard and friable material in the weakly cemented subhorizon in some pedons

### Beowawe Variant

The Beowawe Variant consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. Beowawe Variant soils are on fan piedmonts. Slopes are 4 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Natrargids

**Typical pedon:** Beowawe Variant silt loam, 4 to 8 percent slopes, in an area of the Beowawe Variant-Tomera-Whirlo association:

**A1**—0 to 3 inches; light brownish gray (10YR 6/2) silt loam, dark brown (10YR 3/3) moist; moderate very thin and thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 5 percent pebbles; moderately alkaline (pH 8.0); gradual wavy boundary. (1 to 3 inches thick)

**A2**—3 to 7 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate thin and medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine vesicular and few very fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (2 to 6 inches thick)

**Btn**—7 to 17 inches; light yellowish brown (10YR 6/4) gravelly clay loam, brown (10YR 4/3) moist; strong medium and coarse prismatic structure parting to strong fine and medium subangular blocky; hard, firm, sticky and plastic; common fine and few very fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds; 15 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (6 to 12 inches thick)

**Btnk**—17 to 25 inches; light yellowish brown (10YR 6/4)

gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine roots; few very fine tubular pores; few thin clay films on faces of peds; 15 percent pebbles, 5 percent cobbles; common soft lime threads; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (5 to 10 inches thick)

2Ck—25 to 60 inches; brown (10YR 5/3) extremely gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 60 percent pebbles, 10 percent cobbles; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** Lander County, Nevada; approximately 15 miles south of Battle Mountain, about 1,500 feet south and 1,500 feet east of the northwest corner of sec. 31, T. 29 N., R. 44 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist for short periods in winter and spring

*Soil temperature:* 48 to 52 degrees F

*Depth to 2Ck horizon:* 18 to 31 inches

*A horizon:*

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Reaction—Mildly alkaline or moderately alkaline

*Btn horizon:*

Value—5 or 6 dry

Chroma—2 to 4 dry, 3 or 4 moist

Clay content—27 to 35 percent

Rock fragments—15 to 25 percent, mainly pebbles

Reaction—strongly alkaline or very strongly alkaline

*2Ck horizon:*

Rock fragments—60 to 70 percent, mainly pebbles

Reaction—strongly alkaline or very strongly alkaline

### Berning Series

The Berning series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. Berning soils are on side slopes of fan piedmont remnants. Slopes are 15 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic Xerollic Haplargids

**Typical pedon:** Berning extremely cobbly loam, 15 to 30 percent slopes, in an area of the Berning-Alley

association. Pebbles cover 50 percent and cobbles 15 percent of the soil surface:

A1—0 to 5 inches; brown (10YR 5/3) extremely cobbly loam, dark brown (10YR 4/3) moist; weak very thin platy structure; soft, very friable, nonsticky and slightly plastic; many very fine and fine and few medium roots; many very fine and fine vesicular and few very fine and fine interstitial pores; 35 percent pebbles, 25 percent cobbles, 3 percent stones; neutral (pH 6.8); clear smooth boundary. (2 to 9 inches thick)

A2—5 to 9 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and slightly plastic; many very fine and fine, common medium, and few coarse roots; common very fine and fine interstitial and few very fine tubular pores; 35 percent pebbles; neutral (pH 6.8); clear smooth boundary. (0 to 7 inches thick)

Bt1—9 to 12 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; many very fine, fine, and medium and common coarse roots; common very fine tubular and few very fine interstitial pores; 50 percent pebbles, 5 percent cobbles; common moderately thick clay films on faces of peds; neutral (pH 7.0); abrupt smooth boundary. (3 to 7 inches thick)

Bt2—12 to 18 inches; yellowish brown (10YR 5/6) very gravelly clay loam, dark yellowish brown (10YR 4/6) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; few very fine roots; few very fine tubular pores; many thick clay films on faces of peds; 50 percent pebbles, 5 percent cobbles; neutral (pH 7.2); gradual smooth boundary. (4 to 10 inches thick)

Bt3—18 to 40 inches; yellowish brown (10YR 5/6) very gravelly clay, dark yellowish brown (10YR 4/6) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; many thick clay films on faces of peds; 50 percent pebbles, 5 percent cobbles; neutral (pH 7.2); gradual smooth boundary. (8 to 22 inches thick)

Bt4—40 to 60 inches; yellowish brown (10YR 5/6) extremely gravelly sandy clay loam, dark yellowish brown (10YR 4/6) moist; moderate medium and coarse subangular blocky structure; hard, friable, sticky and plastic; few very fine roots; few very fine tubular pores; 60 percent pebbles, 10 percent cobbles; many moderately thick clay films on faces of peds; neutral (pH 7.2).



**Type location:** Lander County, Nevada; about 22 miles southeast of Battle Mountain, approximately 2,000 feet north and 2,000 feet east of the southwest corner of sec. 16, T. 29 N., R. 47 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in some part from late October through early June

*Soil temperature:* 47 to 52 degrees F

*Depth to base of Bt horizon:* 40 to more than 60 inches

*Control section:* Clay content—35 to 45 percent

*Content of rock fragments:* 50 to 75 percent, mainly pebbles

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak or moderate, very thin platy or fine or medium subangular blocky; massive in some pedons

Consistence—soft or slightly hard dry; very friable or friable moist; nonsticky or slightly sticky, nonplastic or slightly plastic wet

Reaction—slightly acid or neutral

#### Upper part of Bt horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2, 3, or 4

Texture—very gravelly or extremely gravelly sandy clay or clay loam

Clay content—35 to 45 percent when mixed

Rock fragments—50 to 75 percent, mainly pebbles and some cobbles

Structure—weak or moderate, fine or medium subangular blocky or angular blocky; massive in some pedons

Consistence—hard or very hard dry, friable or firm moist, and plastic or very plastic wet

#### Lower part of Bt horizon:

Value—5 or 6 dry, 3 or 4 moist

Texture—very gravelly or extremely gravelly sandy clay loam or sandy loam

Clay content—15 to 25 percent when mixed

Rock fragments—50 to 75 percent, mainly pebbles and some cobbles

Structure—subangular blocky; massive in some pedons

Consistence—hard or very hard dry, firm or friable moist

remnants. Slopes are 2 to 8 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Xerollic Durorthids

**Typical pedon:** Bioya very fine sandy loam, 2 to 8 percent slopes, in an area of the Bioya-Chiara-Cortez association:

A1—0 to 7 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many fine vesicular pores; mildly alkaline (pH 7.6); clear smooth boundary. (3 to 7 inches thick)

A2—7 to 11 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common fine tubular pores; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 10 inches thick)

Bqk1—11 to 18 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; common very fine and fine roots; common fine tubular pores; 30 percent weakly cemented, 5- to 10-millimeter durinodes; few fine soft masses of lime; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 13 inches thick)

Bqk2—18 to 29 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; few very fine and fine roots; few fine tubular pores; 30 percent weakly cemented, 5- to 10-millimeter durinodes; common fine lime filaments; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 10 inches thick)

Bqk3—29 to 33 inches; light yellowish brown (10YR 6/4) silt loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, sticky and plastic; very fine and fine roots; few fine tubular pores; 30 percent weakly cemented, 5- to 10-millimeter durinodes; few fine soft masses of lime; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 12 inches thick)

Bqk4—33 to 38 inches; light yellowish brown (10YR 6/4) silt loam, yellowish brown (10YR 5/6) moist; massive; hard, firm, slightly sticky and plastic; few very fine and fine roots; few fine tubular pores; 50 percent weakly cemented, 5- to 15-millimeter durinodes; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 8 inches thick)

### Bioya Series

The Bioya series consists of moderately deep, well drained soils formed in loess over alluvium derived from volcanic rock. Bioya soils are on fan piedmont

**Bqkm**—38 to 60 inches; very pale brown (10YR 8/3) indurated duripan, very pale brown (10YR 7/4) moist; massive; very hard, extremely firm; thin continuous laminar cap; violently effervescent with disseminated lime.

**Type location:** Lander County, Nevada; about 18 miles north of Battle Mountain, approximately 1,200 feet north and 750 feet east of the southwest corner of sec. 35, T. 35 N., R. 46 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Depth to Bqk horizon:* 8 to 19 inches

*Depth to indurated duripan:* 20 to 40 inches

*Control section:* Clay content—18 to 27 percent

*Reaction:* Mildly alkaline to very strongly alkaline, becoming more alkaline with depth

*Other features:* Thin Bw horizon above a depth of 10 inches in some pedons; Bq horizon with no carbonates and value of 8 dry in some pedons

#### A horizon:

Value—5 or 6 dry, 3 to 5 moist; more than 5.5 dry and 3.5 moist when the uppermost 7 inches are mixed

Chroma—2 to 4

Structure—weak to strong, very thin to thick platy; fine to coarse subangular blocky in the lower part of some pedons

Reaction—mildly alkaline or moderately alkaline

#### Bqk horizon:

Value—6 to 8 dry, 4 to 6 moist

Chroma—3 to 6

Texture—silt loam, or loam

Structure—subangular blocky; massive in some pedons

Reaction—mildly to very strongly alkaline

Other features—20 to 50 percent durinodes; or weak discontinuous silica cementation

#### Bqkm horizon:

Structure—thick or very thick platy; massive in some pedons

### Blacka Series

The Blacka series consists of moderately deep, well drained soils that formed in loess over alluvium derived from mixed rock sources. Blacka soils are on fan piedmont remnants. Slopes are 0 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Entic Durorthids

**Typical pedon:** Blacka very fine sandy loam, 0 to 2 percent slopes:

**A1**—0 to 4 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate coarse prismatic structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine roots; many vesicular and common very fine tubular pores; very slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 7 inches thick)

**A2**—4 to 8 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 4/3) moist; moderate coarse prismatic structure parting to weak thin and medium platy; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine interstitial and few fine tubular pores; strongly alkaline (pH 8.5); clear wavy boundary. (0 to 6 inches)

**Bw**—8 to 21 inches; light gray (10YR 7/2) fine sandy loam, brown (10YR 4/3) moist; weak coarse and very coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine interstitial and tubular pores; strongly alkaline (pH 8.6); abrupt wavy boundary. (6 to 13 inches thick)

**Bqkm1**—21 to 23 inches; pale brown (10YR 6/3) strongly silica-cemented duripan, dark brown (10YR 3/3) moist; massive, with medium and thick continuous plates; very hard, very firm, brittle; many very fine and few fine and medium roots between plates; common very fine tubular pores; up to 1/16-inch-thick white (10YR 8/2) and light yellowish brown (10YR 6/4 moist) silica laminae on top of plates; slightly effervescent; thick coatings of secondary carbonates on plates; strongly alkaline (pH 8.6); abrupt wavy boundary. (1 to 5 inches thick)

**Bqkm2**—23 to 31 inches; pale brown (10YR 6/3) strongly silica-cemented duripan, brown (10YR 4/3) moist; few fine faint light yellowish brown (10YR 6/4) mottles; massive, with continuous weak thick plates; very hard, very firm, brittle; few very fine and fine roots; common very fine tubular pores; 30 percent 10- to 20-millimeter, weak durinodes; strongly effervescent; many medium filaments, seams, and coatings of secondary carbonates on plates; strongly alkaline (pH 8.6); clear wavy boundary. (8 to 16 inches thick)

**Cqk1**—31 to 41 inches; pale brown (10YR 6/3) sandy loam, dark yellowish brown (10YR 4/4) moist; massive; very hard, firm, nonsticky and nonplastic;

few very fine roots; common very fine tubular pores; continuous weakly or strongly silica-cemented platelike layers; strongly effervescent; common fine and medium filaments and seams of secondary carbonates; strongly alkaline (pH 8.6); abrupt wavy boundary. (6 to 14 inches thick)

**Cqk2**—41 to 48 inches; light yellowish brown (10YR 6/4) and very pale brown (10YR 8/3) sandy loam, brown (10YR 4/3) and pale brown (10YR 6/3) moist; many fine distinct dark reddish brown (5YR 3/3 moist) and dark reddish brown (5YR 2/2 moist) relict mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 25 percent 10- to 20-millimeter, weak and moderately strong durinodes; strongly effervescent; common fine filaments and seams of secondary carbonates; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 12 inches thick)

**Cky**—48 to 64 inches; reddish yellow (7.5YR 6/6) loam, brown (7.5YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine interstitial and tubular pores; strongly effervescent; many fine and large filaments and seams of secondary carbonates and gypsum; few fine iron and manganese shot; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; approximately 13 miles north of Battle Mountain, about 1,800 feet north and 2,700 feet west of the approximate southeast corner of sec. 19, T. 34 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in part for short periods from October through May

**Soil temperature:** 47 to 53 degrees F

**Depth to strongly cemented duripan:** 20 to 26 inches

**Depth to base of Bw horizon:** 12 to 21 inches

**Control section:** Clay content—5 to 15 percent; texture—averages fine sandy loam or very fine sandy loam that is 15 to 35 percent fine sand or coarser

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Salt and sodium:** Generally not salt and sodium affected above the duripan and strongly salt and sodium affected below; strongly salt and sodium affected throughout in some pedons

**Other features:** Continuous or discontinuous weakly cemented Bq horizons above the duripan in some pedons

**A horizon:**

Hue—10YR or 2.5Y

Other features—some pedons are slightly

effervescent on the immediate surface because of recharge from calcareous dust

**Bw horizon:**

Value—6 or 7 dry

Chroma—2 or 3

Texture—fine sandy loam or very fine sandy loam that has thin strata of sandy loam or loam in some pedons

**Bqkm horizon:**

Consistence—hard or very hard dry

Effervescence—slight to violent

**Cqk horizon:**

Value—6 to 8 dry, 4 to 6 moist

Chroma—3 to 6 dry, 3 or 4 moist

Texture—dominantly sandy loam, strata of fine sandy loam or loam in some pedons

Other features—as much as 40 percent durinodes, relict iron mottles in some pedons

### Blackhawk Series

The Blackhawk series consists of shallow, well drained soils that formed in loess and mixed alluvium. Blackhawk soils are on fan piedmont remnants. Slopes are 0 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Entic Durorthids

**Typical pedon:** Blackhawk very fine sandy loam, 0 to 4 percent slopes, in an area of the Golconda-Blackhawk association:

**A**—0 to 8 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; soft, very friable, nonsticky and nonplastic; many fine and very fine and few medium roots; many fine tubular pores; 3 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 8 inches thick)

**Bw**—8 to 14 inches; very pale brown (10YR 7/3) loam, brown (10YR 4/3) moist; weak fine and medium subangular structure; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine roots; many fine tubular pores; 3 percent pebbles; slightly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (6 to 15 inches thick)

**Bqkm**—14 to 17 inches; brown (10YR 5/3) strongly silica-cemented duripan, dark brown (10YR 4/3) moist; massive; extremely hard, extremely firm; few fine roots matted on surface of peds; common fine soft lime filaments; violently effervescent; strongly

alkaline (pH 9.0); abrupt smooth boundary. (2 to 5 inches thick)

**Bk1**—17 to 38 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; 5 percent pebbles; few fine soft lime filaments; violently effervescent; very strongly alkaline (pH 8.6); clear smooth boundary. (0 to 21 inches thick)

**2Bk2**—38 to 47 inches; very pale brown (10YR 7/3) very gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; hard, friable, nonsticky and nonplastic; few fine roots; few fine tubular pores; 40 percent pebbles; common medium soft lime masses; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 10 inches thick)

**3Bk3**—47 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable; few fine roots; few fine tubular pores; 70 percent pebbles; common fine soft lime masses; slightly effervescent; moderately alkaline (pH 8.0).

**Type location:** Lander County, Nevada; about 8 miles north of Battle Mountain, approximately 1,500 feet north and 500 feet east of the southwest corner of sec. 26, T. 33 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and early spring

**Soil temperature:** 47 to 54 degrees F

**Depth to duripan:** 14 to 20 inches

**Control section:** Clay content—averages 5 to 10 percent; content of rock fragments—up to 30 percent, mainly pebbles; silt plus very fine sand—65 to 80 percent

#### A horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—weak or moderate, very thin to thick platy; massive in some pedons

Reaction—mildly alkaline to strongly alkaline

#### Bw horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—silt loam, loam, very fine sandy loam

Clay content—averages 5 to 10 percent

Rock fragments—0 to 30 percent, mainly pebbles

Structure—weak or moderate, thin or thick platy; subangular blocky; massive in some pedons  
Reaction—mildly alkaline to strongly alkaline

#### Duripan:

Consistence—very hard or extremely hard

Reaction—moderately alkaline to very strongly alkaline

Silica cementation—duripan consists generally of two or more strongly cemented layers interbedded with weakly silica-cemented material or strata that has friable matrix containing durinodes

#### Bk horizon:

Hue—10YR or 2.5Y

Value—5 to 7 dry, 4 to 6 moist

Chroma—2 or 3

Structure—weak to strong, thin or thick platy; massive in some pedons

Texture—stratified loam, gravelly coarse sandy loam, or gravelly coarse sand

#### 2Bk and 3Bk horizons:

Texture—unconformable strata of very gravelly or extremely gravelly sand, coarse sand, loamy coarse sand, and sandy loam below a depth of 30 inches

Other features—strata of clay below a depth of 30 inches in some pedons

### Bojo Series

The Bojo series consists of shallow, well drained soils that formed in residuum of extrusive volcanic rocks. Bojo soils are on summits, crests, and side slopes of hills and mountains. Slopes are 8 to 75 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic Lithic Haplargids

**Typical pedon:** Bojo fine sandy loam, 8 to 30 percent slopes, extremely stony, in an area of the Bojo-Stingdorn association:

**A1**—0 to 2 inches; light brownish gray (10YR 6/2) very stony fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine vesicular pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 5 inches thick)

**A2**—2 to 4 inches; light brownish gray (10YR 6/2) fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly

sticky and nonplastic; common very fine roots; few very fine tubular and interstitial pores; 10 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 3 inches thick)

Bt1—4 to 8 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; many very fine interstitial pores; 10 percent pebbles; few thin clay films on faces of peds and lining pores; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 8 inches thick)

Bt2—8 to 10 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; slightly hard, friable, very sticky and plastic; common very fine and fine roots; few very fine tubular pores; 10 percent pebbles; common moderately thick clay films on faces of peds and lining pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (0 to 4 inches thick)

R—10 inches; welded tuff.

**Type location:** Lander County, Nevada; about 20 miles southwest of Battle Mountain, approximately 1,600 feet east and 1,600 feet north of the southwest corner of sec. 2, T. 29 N., R. 42 E.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from June through October

*Soil temperature:* 47 to 49 degrees F

*Control section:* Clay content—18 to 35 percent; content of rock fragments—15 to 35 percent; reaction—mildly alkaline or moderately alkaline; depth to bedrock—5 to 14 inches

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

#### Bt horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—2, 3, or 4

Rock fragments—10 to 25 percent, dominantly pebbles

Textures—loam, clay loam, sandy clay loam, gravelly clay loam, or gravelly loam

Clay content—25 to 35 percent

Other features—slightly calcareous in some pedons

### Boulflat Series

The Boulflat series consists of moderately deep, well drained soils that formed in some loess high in content

of volcanic ash but mainly in residuum and colluvium derived from chert, shale, quartzite, and andesite.

Boulflat soils are on crests and side slopes of mountains and hills. Slopes are 4 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic

Haploxerollic Durargids

**Typical pedon:** Boulflat gravelly loam, 4 to 30 percent slopes, in an area of the Boulflat-Havingdon-Dewar association:

A—0 to 6 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine and medium roots; many very fine interstitial pores and few very fine tubular pores; 20 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); clear wavy boundary. (2 to 6 inches thick)

Bt1—6 to 11 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; many very fine and few fine and medium roots; many very fine tubular pores; common thin clay films on faces of peds; 20 percent pebbles; mildly alkaline (pH 7.8); gradual wavy boundary. (4 to 12 inches thick)

Bt2—11 to 23 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; many very fine and few fine, medium, and coarse roots; many very fine tubular pores; common thin clay films on faces of peds; 30 percent pebbles; mildly alkaline (pH 7.8); gradual wavy boundary. (0 to 12 inches thick)

Bqkm—23 to 32 inches; very pale brown (10YR 8/3) strongly cemented duripan with a 0.1- to 1-millimeter-thick, discontinuous laminar cap; very pale brown (10YR 7/4) moist; massive; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (4 to 15 inches thick)

R—32 inches; fractured chert.

**Type location:** Lander County, Nevada; about 10 miles southwest of Battle Mountain, approximately 2,400 feet south and 500 feet west of the northeast corner of sec. 12, T. 31 N., R. 46 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in some part from late October through early June

*Soil temperature:* 47 to 52 degrees F

*Depth to strongly cemented duripan:* 20 to 34 inches

*Depth to hard bedrock:* 22 to 40 inches

*A horizon:*

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak to strong, very thin to thick platy or granular

Consistence—soft or slightly hard dry, very friable or friable moist

Reaction—neutral or mildly alkaline

*Bt horizon:*

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly loam, gravelly clay loam, or gravelly sandy clay loam

Clay content—25 to 35 percent

Rock fragments—15 to 35 percent, mainly pebbles

Structure—weak or moderate, very fine to medium subangular or angular blocky

Reaction—neutral or mildly alkaline

*Bqkm horizon:*

Value—7 or 8 dry, 6 to 8 moist

Chroma—1 to 4

Effervescence—strong or violent

Silica laminae—as much as 5 millimeters thick and not continuous horizontally

Other features—strongly cemented duripan rests directly on bedrock

This pedon is a taxadjunct to the Bouflat series because it does not have a Bk horizon. The Bouflat series has an 8- to 14-inch-thick Bk horizon immediately above the duripan. Use and management are the same.

## **Bregar Series**

The Bregar series consists of shallow, well drained soils that formed in residuum and colluvium derived from igneous flow rocks, tuff, and quartzite. Bregar soils are on crests and upper side slopes of mountains. Slopes are 4 to 75 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Xerollic Haplargids

**Typical pedon:** Bregar extremely cobbly loam, 4 to 15 percent slopes, in an area of the Bregar-Punchbowl association. Pebbles cover 35 percent and cobbles 35 percent of the soil surface:

A—0 to 4 inches; pale brown (10YR 6/3) extremely cobbly loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; soft, very friable,

slightly sticky and slightly plastic; many very fine and medium roots; many very fine tubular and interstitial pores; 30 percent pebbles, 30 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 6 inches thick)

Bt1—4 to 8 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine and few medium roots; common very fine interstitial and tubular pores; common thin clay films on faces of peds; 25 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (2 to 6 inches thick)

Bt2—8 to 11 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine angular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and few fine and medium roots; few very fine interstitial and common very fine tubular pores; common thin and few moderately thick clay films on faces of peds; 10 percent pebbles, 45 percent cobbles; neutral (pH 7.3); abrupt broken boundary. (0 to 4 inches thick)

2R—11 inches; fractured rhyolitic tuff; clay coatings on fracture planes.

**Type location:** Lander County, Nevada; about 38 miles southwest of Battle Mountain, approximately 2,600 feet east of the assumed northwest corner of sec. 10, T. 26 N., R. 42 E.

### **Range in Characteristics**

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 43 to 46 degrees F

*Depth to bedrock:* 5 to 12 inches

*Reaction throughout the profile:* Slightly acid to mildly alkaline

*Other features:* Bw horizon as much as 5 inches thick in some pedons; upper 3 inches of bedrock weathered to various degrees in some pedons

*A horizon:*

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak to strong, very fine to medium granular or subangular blocky; thin to medium platy; massive in some pedons

Consistence—soft or slightly hard dry

*Bt horizon:*

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 to 5 moist

Chroma—2 to 4

Texture—very gravelly clay loam, very cobbly clay loam, extremely cobbly clay loam, very gravelly sandy clay loam, extremely cobbly sandy clay

loam, or very gravelly loam; extremely gravelly loam in some pedons  
 Clay content—25 to 35 percent  
 Rock fragments—35 to 75 percent, mainly pebbles and cobbles with as much as 15 percent stones  
 Structure—weak or moderate, fine or medium angular or subangular blocky; massive in some pedons  
 Other features—broken, irregular, or wavy lower boundary

### ***Broyles Series***

The Broyles series consists of very deep, well drained soils that formed in a thin loess mantle over mixed loamy alluvium. Broyles soils are on fan skirts, inset fan remnants, and fan aprons. Slopes are 0 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Duric Camborthids

**Typical pedon:** Broyles very fine sandy loam, 0 to 2 percent slopes:

- A—0 to 5 inches; light brownish gray (10YR 6/2) very fine sandy loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and common medium oblique roots; many very fine vesicular pores; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 7 inches thick)
- Bw—5 to 11 inches; light gray (10YR 7/2) very fine sandy loam, dark brown (10YR 4/3) moist; yellowish brown (10YR 5/4) stains on faces of peds; weak and moderate medium and thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; very fine vesicular, interstitial, and tubular pores; strongly alkaline (pH 8.6); abrupt wavy boundary. (4 to 21 inches thick)
- 2Bk—11 to 15 inches; light gray (10YR 7/2) sandy loam, brown (10YR 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine random and very few medium oblique roots; many very fine vesicular, interstitial, and tubular pores; about 1 percent 15- to 30-millimeter, hard, firm, brittle durinodes; very slightly effervescent matrix, strongly effervescent in spots; very strongly alkaline (pH 9.2); abrupt wavy boundary. (0 to 12 inches thick)
- 2Bqk—15 to 19 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very

fine roots; many very fine vesicular, interstitial, and tubular pores; about 25 percent 10- to 25-millimeter, hard, firm, brittle durinodes; common fine lime filaments and threads; strongly effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (4 to 26 inches thick)

2Bqky1—19 to 28 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; very few very fine roots; common very fine vesicular, interstitial, and tubular pores; about 30 percent 15- to 30-millimeter, hard, firm, brittle durinodes; few fine gypsum crystal filaments, threads, and seams up to 3 inches wide; slightly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (0 to 14 inches thick)

3Bqky2—28 to 44 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; very few very fine roots; common very fine vesicular, interstitial, and tubular pores; about 20 percent 20- to 35-millimeter, hard, firm, brittle durinodes; common fine gypsum crystal filaments, threads, and seams up to 3 inches wide; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 16 inches thick)

3Cq—44 to 60 inches; very pale brown (10YR 7/3) loamy fine sand, brown (10YR 4/3) moist; massive; hard, firm, nonsticky and nonplastic; common very fine tubular pores; silica cementation bridging sand grains; nonbrittle when wet; strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada; about 21 miles south of Battle Mountain, approximately 3,420 feet east and 700 feet north of the southwest corner of sec. 30, T. 32 N., R. 45 E.

### **Range in Characteristics**

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 55 degrees F

**Depth to Bk or Bqk horizon:** 10 to 24 inches

**Control section:** Clay content—5 to 15 percent;

texture—fine sandy loam, very fine sandy loam, or silt loam in the upper part and loam, fine sandy loam, sandy loam, and loamy sand in the lower part; content of rock fragments—0 to 35 percent pebbles, mostly in the lower part

**Other features:** Strongly cemented duripans below a depth of 40 inches in some pedons

**A horizon:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—weak or moderate, thin to thick platy; massive in some pedons

Reaction—moderately alkaline or strongly alkaline

Carbonates—normally noncalcareous, effervescent in some pedons because of recharge from dust

**Bw horizon:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—weak fine or medium subangular blocky; platy; prismatic; massive in some pedons

Reaction—moderately alkaline or strongly alkaline

**2Bqk horizon:**

Reaction—strongly alkaline or very strongly alkaline

Cementation—20 to 75 percent durinodes, very weak silica cementation in the matrix surrounding the durinodes in some pedons

Other features—few or common fine gypsum filaments or seams in some pedons

**3C horizon:**

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—1 to 4

Reaction—strongly alkaline or very strongly alkaline

## **Bubus Series**

The Bubus series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources of mostly volcanic origin that are high in content of pyroclastic materials. Bubus soils are on alluvial flat remnants and lake plain terraces. Slopes are 0 to 4 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Durorthic Torriorthents

**Typical pedon:** Bubus very fine sandy loam:

A—0 to 6 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and nonplastic; many very fine, fine, and medium vesicular and many very fine interstitial pores; 10 percent fine pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (2 to 10 inches thick)

C1—6 to 10 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak very thin and thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and

common fine and medium roots; few very fine interstitial and common very fine tubular pores; 5 percent fine pebbles; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (3 to 11 inches thick)

C2—10 to 15 inches; very pale brown (10YR 7/3) very fine sandy loam, yellowish brown (10YR 5/4) moist; moderate very thin and thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine and medium roots; common very fine interstitial and tubular pores; 5 percent fine pebbles; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (5 to 8 inches thick)

Cqk1—15 to 29 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; few fine faint brown (7.5YR 5/4 and 4/4 moist) mottles; massive; slightly hard and hard, very friable, slightly sticky and slightly plastic; few very fine to medium roots; common very fine tubular pores; 3 percent pebbles; 35 percent 2- to 35-millimeter, hard, firm and very firm, brittle durinodes; fine filaments and threads of gypsum; violently effervescent; strongly alkaline (pH 8.6); gradual wavy boundary. (7 to 16 inches thick)

Cqk2—29 to 60 inches; very pale brown (10YR 7/4) very fine sandy loam, yellowish brown (10YR 5/4) moist; few fine distinct yellowish brown (10YR 5/6 moist) and few fine faint dark yellowish brown (10YR 4/4 moist) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; 3 percent fine pebbles; 35 percent 2- to 30-millimeter, hard, firm, brittle durinodes; fine filaments and threads of gypsum; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; approximately 1.6 miles southeast of Battle Mountain, about 2,100 feet south and 1,750 feet east of the northwest corner of sec. 28, T. 32 N., R. 45 E.

### **Range in Characteristics**

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 53 degrees F

**Control section:** Clay content—10 to 15 percent; content of rock fragments—0 to 5 percent pebbles

**Salt and sodium:** Normally strongly affected throughout, but moderately or slightly affected in the upper horizons in some pedons

**Other features:** Faint or distinct iron mottles and gypsum segregations below a depth of 10 inches in some pedons

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist



Chroma—2, 3, or 4

Structure—platy or massive

Consistence—nonsticky or slightly sticky, nonplastic or slightly plastic

Reaction—moderately alkaline to very strongly alkaline

Effervescence—slightly, strongly, or violently effervescent

*C horizon:*

Value—6 or 7 dry, 4 to 6 moist

Chroma—2 to 4

Texture—loam, silt loam, very fine sandy loam, fine sandy loam, or sandy loam, dominantly very fine sandy loam

Structure—platy; massive in some pedons

Reaction—moderately alkaline to very strongly alkaline, commonly becoming less alkaline with depth

Effervescent—strongly or violently effervescent

*Cqk horizon:*

Reaction—moderately alkaline to very strongly alkaline

Other features—20 to 70 percent durinodes

*2C horizon (where present):*

Stratified sand and gravel below a depth of 40 inches in some pedons

## **Bucan Series**

The Bucan series consist of deep, well drained soils formed in loess high in content of volcanic ash over residuum of weathered volcanic rocks and tuff. Bucan soils are on side slopes of mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Xerollic Haplargids

**Typical pedon:** Bucan cobbly loam, 15 to 30 percent slopes, in an area of the Bucan-Bucan, steep, association. Cobbles cover 15 percent of the soil surface:

**A1**—0 to 3 inches; pale brown (10YR 6/3) cobbly loam, brown (10YR 4/3) moist; weak thin and very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common fine tubular and interstitial pores; 15 percent pebbles, 15 percent cobbles; neutral (pH 7.0); clear smooth boundary. (2 to 6 inches thick)

**A2**—3 to 5 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, very friable,

sticky and plastic; many fine and very fine and few medium roots; common very fine tubular and many fine interstitial pores; neutral (pH 6.8); abrupt smooth boundary. (0 to 7 inches thick)

**Bt1**—5 to 8 inches; pale brown (10YR 6/3) clay, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and very plastic; common very fine and fine roots; many very fine tubular pores; 10 percent pebbles; continuous thick clay films on faces of peds; mildly alkaline (pH 7.6); clear wavy boundary. (3 to 10 inches thick)

**Bt2**—8 to 15 inches; dark yellowish brown (10YR 4/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; very hard, very firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; 10 percent pebbles; continuous thick clay films on faces of peds; mildly alkaline (pH 7.6); clear wavy boundary. (7 to 15 inches thick)

**Btk1**—15 to 23 inches; dark yellowish brown (10YR 4/6) gravelly clay, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, very sticky and very plastic; common very fine and few fine roots; common very fine tubular pores; 20 percent pebbles; lime coatings on underside of pebbles; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary. (8 to 18 inches thick)

**2Btk2**—23 to 42 inches; dark yellowish brown (10YR 4/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and very plastic; common very fine roots; common very fine and few fine tubular pores; 30 percent pebbles; lime coatings on underside of rocks; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (0 to 20 inches thick)

**R**—42 inches; basalt.

**Type location:** Lander County, Nevada; about 15 miles southeast of Battle Mountain, approximately 2,500 feet north and 1,400 feet west of the southeast corner of sec. 15, T. 30 N., R. 47 E.

### **Range in Characteristics**

**Soil moisture:** Usually dry, moist in part from late October through early June

**Soil temperature:** 45 to 47 degrees F

**Solum thickness and depth to bedrock:** 40 to 60 inches

**Control section:** Clay content—45 to 60 percent; content of rock fragments—as much as 15 percent when mixed; depth to segregated lime—15 to 30 inches

*A horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak or moderate, very thin to medium platy or fine or medium granular or subangular blocky; massive in some pedons  
 Consistence—soft or slightly hard dry  
 Other features—when mixed to a depth of 7 inches, the dry value is 6 or the thickness of the epipedon is less than one-third the solum thickness

**Bt horizon:**

Value—4 to 6 dry, 3 to 5 moist  
 Chroma—2 to 4  
 Clay content—45 to 60 percent  
 Rock fragments—up to 15 percent  
 Structure—weak to strong, fine or medium subangular or angular blocky in the Bt1, moderate or strong, fine or medium prismatic in the Bt2  
 Reaction—neutral or mildly alkaline

**Btk horizon:**

Value—4 to 6 dry, 4 or 5 moist  
 Chroma—3 to 6  
 Texture—gravelly clay loam, gravelly clay, or cobbly clay  
 Clay content—35 to 45 percent  
 Rock fragments—15 to 35 percent, mainly pebbles that have cobbles common in some subhorizons  
 Structure—medium or fine angular blocky; prismatic; massive in some pedons  
 Reaction—mildly alkaline to strongly alkaline

## Buffaran Series

The Buffaran series consists of shallow, well drained soils that formed in alluvium derived from mixed rock sources. Buffaran soils are on fan piedmonts, mountain valley fans, and ballenas. Slopes are 2 to 8 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Xerollic Durargids

**Typical pedon:** Buffaran cobbly loam, 2 to 8 percent slopes, in an area of the Buffaran-Wieland association. Pebbles cover 25 percent and cobbles 5 percent of the soil surface:

A1—0 to 2 inches; pale brown (10YR 6/3) cobbly loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; few medium roots; many very fine interstitial and tubular pores; 10 percent pebbles, 10 percent cobbles; neutral (pH 7.2); abrupt smooth boundary. (1 to 5 inches thick)

A2—2 to 4 inches; brown (10YR 5/3) cobbly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common fine roots; many very fine and fine tubular pores; 10 percent pebbles, 10 percent cobbles; neutral (pH 7.2); abrupt smooth boundary. (0 to 4 inches thick)

Bt1—4 to 8 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine prismatic structure parting to strong medium granular; slightly hard, friable, sticky and plastic; common fine and medium roots; many very fine and fine tubular pores; common moderately thick clay films on peds; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (0 to 4 inches thick)

Bt2—8 to 13 inches; yellowish brown (10YR 5/4) gravelly clay, dark brown (10YR 4/3) moist; strong medium prismatic structure parting to moderate fine subangular blocky; hard, firm, very sticky and very plastic; few fine and medium roots; many very fine and fine tubular pores; few thick and many thin clay films on peds and in pores; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear wavy boundary. (3 to 8 inches thick)

Bt3—13 to 15 inches; yellowish brown (10YR 5/4) gravelly clay, dark brown (10YR 4/3) moist; strong fine angular blocky structure; hard, firm, very sticky and very plastic; few thick and many thin clay films on peds and in pores; 15 percent pebbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (2 to 7 inches thick)

Bqkm—15 to 60 inches; white (10YR 8/2) indurated duripan, very pale brown (10YR 7/3) moist; massive; 2- to 6-millimeter, horizontal silica laminae capping and within matrix; extremely hard, extremely firm; 30 percent pebbles, 25 percent cobbles, 10 percent stones; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 25 miles south of Battle Mountain, approximately 1,750 feet east and 3,000 feet south of the northwest corner of sec. 26, T. 28 N., R. 45 E.

### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to duripan:** 14 to 20 inches

**A horizon:**

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 or 4 moist; more than 5.5 dry after mixing the uppermost 7 inches

Chroma—2 or 3

Structure—subangular blocky or platy

*Bt horizon:*

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—2, 3, 4, or 6

Clay content—35 to 50 percent

Texture—clay or clay loam

Rock fragments—10 to 30 percent, mostly gravel

Reaction—neutral or mildly alkaline

*Bq horizon (where present):*

Texture—loam or clay loam

Rock fragments—20 to 40 percent strongly  
cemented duripan fragments

Reaction—neutral to moderately alkaline

Effervescence—noneffervescent to strongly  
effervescent

## Burnborough Series

The Burnborough series consists of very deep, well drained soils that formed in residuum and colluvium dominantly derived from andesitic and rhyolytic rock. Burnborough soils are on side slopes of mountains. Slopes are 15 to 75 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic  
Argixerolls

**Typical pedon:** Burnborough very gravelly loam, 30 to 50 percent slopes, in an area of the Burnborough-Sumine-Burrita association. Pebbles cover 35 percent and cobbles 5 percent of the soil surface:

A1—0 to 3 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine vesicular pores; 40 percent pebbles; neutral (pH 7.0); abrupt smooth boundary. (3 to 8 inches thick)

A2—3 to 10 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine and fine vesicular pores; 25 percent pebbles; neutral (pH 6.8); clear smooth boundary. (3 to 8 inches thick)

Bt1—10 to 16 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; few thin clay films on faces of peds; 40 percent pebbles;

neutral (pH 7.0); clear smooth boundary. (0 to 10 inches thick)

Bt2—16 to 26 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; few thin clay films on faces of peds; 45 percent pebbles; neutral (pH 7.2); clear wavy boundary. (8 to 16 inches thick)

Bt3—26 to 36 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; common thin clay films on peds faces; 55 percent pebbles; neutral (pH 7.2); gradual wavy boundary. (0 to 12 inches thick)

Bt4—36 to 60 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; few very fine tubular pores; common thin clay films on faces of peds; 55 percent pebbles; neutral (pH 7.3).

**Type location:** Lander County, Nevada; about 40 miles southwest of Battle Mountain, approximately 2,000 feet south and 500 feet west of the northeast corner of sec. 14, T. 27 N., R. 40 E.

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall; depth of wetting exceeds 30 inches in most years

**Soil temperature:** 42 to 46 degrees F

**Depth to bedrock:** 60 to 80 inches

**Mollic epipedon:** 10 to 20 inches thick and includes the Bt1 horizon

**Reaction throughout the profile:** Slightly acid or neutral throughout

*A horizon:*

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

*Bt1 horizon:*

Value—4 or 5 dry

Chroma—2 or 3

Texture—very gravelly sandy loam or very gravelly loam

Clay content—18 to 25 percent

Rock fragments—35 to 50 percent, mainly pebbles

*Bt2 and Bt3 horizons:*

Value—5 or 6 dry, 3, 4, or 5 moist

Chroma—3 or 4 dry

Texture—very gravelly loam or very gravelly clay loam

Clay content—18 to 35 percent

Rock fragments—35 to 60 percent, mainly pebbles

*C horizon (where present):*

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 to 6

Texture—loam to loamy sand

Rock fragments—35 to 75 percent, mainly pebbles

## **Burrita Series**

The Burrita series consists of shallow, well drained soils formed in residuum and colluvium of interbedded chert, quartzite, sandstone, and shale. Burrita soils are on crests and side slopes of hills and mountains. Slopes are 4 to 75 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic, Lithic Xerollic Haplargids

**Typical pedon:** Burrita very cobbly loam, 4 to 15 percent slopes, in an area of the Trunk-Burrita-Rock outcrop association:

A—0 to 3 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; many fine and common medium vesicular pores; 20 percent pebbles, 25 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 5 inches thick)

Bt1—3 to 6 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; common fine and few medium tubular pores; 30 percent pebbles, 5 percent cobbles; common thin and few moderately thick clay films on faces of peds and lining pores; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 5 inches thick)

Bt2—6 to 13 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; strong medium angular blocky structure; hard, firm, sticky and plastic; common fine and few fine and medium roots; common fine and few medium tubular pores; 30 percent pebbles, 5 percent cobbles; common moderately thick clay films on faces of peds and lining pores; moderately alkaline (pH 8.2); clear wavy boundary. (7 to 10 inches thick)

Bt3—13 to 18 inches; yellowish brown (10YR 5/4) very cobbly clay loam, dark yellowish brown (10YR 3/4) moist; strong medium angular blocky structure; hard, friable, very sticky and very plastic; few fine and medium roots; few fine and medium tubular pores; 30 percent pebbles, 20 percent cobbles; common moderately thick clay films on faces of peds and lining pores; moderately alkaline (pH 8.2); abrupt smooth boundary. (0 to 5 inches thick)

R—18 inches; quartzite.

**Type location:** Lander County, Nevada; about 22 miles south of Battle Mountain, approximately 2,400 feet south and 2,600 feet west of the approximate northeast corner of sec. 28, T. 28 N., R. 44 E.

### **Range in Characteristics**

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 50 degrees F

*A and Bt thickness and depth to bedrock:* 14 to 20 inches

*Control section:* Clay content—35 to 50 percent; content of rock fragments—35 to 60 percent when mixed, mainly pebbles, cobbles, or stones

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

*A horizon:*

Value—5 to 7 dry, 3 to 5 moist

Chroma—2, 3, or 4

Consistence—soft or slightly hard

*Bt horizon:*

Hue—10YR or 7.5 YR

Value—4 to 6 dry, 3 or 4 moist

Chroma—3 to 6

Texture—very gravelly clay, very cobbly clay, very stony clay, very gravelly clay loam, very cobbly clay loam, very stony clay loam

Structure—subangular or angular blocky; massive in some pedons

## **Caniwe Series**

The Caniwe series consists of very deep, well drained soils that formed in loess and alluvium derived from mixed rock sources. Caniwe soils are on inset fans within mountain valley fans. Slopes are 2 to 8 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Aridic Duric Haploxerolls

**Typical pedon:** Caniwe silt loam, 2 to 8 percent slopes, in an area of the Handy-Caniwe-Zoesta association:

A1—0 to 4 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; soft, very friable, slightly sticky and nonplastic; common very fine, fine, and medium roots; common very fine tubular pores; neutral (pH 7.0); abrupt smooth boundary. (3 to 6 inches thick)

A2—4 to 9 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate thin platy; slightly hard, very friable, sticky and plastic; common very fine, fine, and medium roots; common very fine tubular pores; neutral (pH 7.3); clear smooth boundary. (4 to 10 inches thick)

A3—9 to 17 inches; grayish brown (10YR 5/2) silt loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, fine, and medium roots; common very fine tubular pores; neutral (pH 7.2); gradual wavy boundary. (0 to 8 inches thick)

2Cq1—17 to 29 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, very friable, very sticky and very plastic; few very fine roots; common very fine tubular pores; 40 percent 5- to 15-millimeter, weakly cemented durinodes; mildly alkaline (pH 7.4); gradual wavy boundary. (6 to 12 inches thick)

2Cq2—29 to 40 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, very friable, sticky and plastic; few very fine roots; common very fine tubular pores; 55 percent 5- to 15-millimeter, weakly cemented durinodes; mildly alkaline (pH 7.6); clear wavy boundary. (6 to 28 inches thick)

3Ck—40 to 60 inches; very pale brown (10YR 7/3) silt loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and plastic; very few very fine roots; few very fine tubular pores; common strongly effervescent fine lime seams and filaments; noneffervescent matrix; moderately alkaline (pH 8.0).

**Type location:** Lander County, Nevada; approximately 35 miles south of Battle Mountain, about 600 feet north and 1,200 feet east of the southwest corner of sec. 8, T. 25 N., R. 46 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Mollic epipedon thickness:* 10 to 19 inches

*Depth to Cq horizon:* 14 to 26 inches

*Depth to carbonates:* 30 to 46 inches

*Control section:* Clay content—20 to 35 percent; content of rock fragments—less than 5 percent; texture—silt loam or silty clay loam, thin strata of clay loam or loam in some pedons

*A horizon:*

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

*2Cq horizon:*

Value—3 or 4 moist

Chroma—2 to 4

Reaction—mildly alkaline or moderately alkaline

Durinodes—25 to 60 percent weakly silica cemented in a very friable or friable matrix

### Chen Series

The Chen series consists of shallow, well drained soils that formed in residuum and colluvium weathered from volcanic rocks and chert with a component of loess high in content of volcanic ash. Chen soils are on crests and side slopes of hills and mountains. Slopes are 2 to 30 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Chen very gravelly loam, 4 to 15 percent slopes, in an area of the Chen-Slaven-Chen, cobbly association:

A1—0 to 3 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; 10 percent cobbles, 35 percent pebbles; mildly alkaline (pH 6.6); clear smooth boundary. (2 to 6 inches thick)

A2—3 to 10 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine and common medium roots; many very fine and fine tubular pores; 10 percent cobbles, 30 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary. (2 to 7 inches thick)

Bt—10 to 16 inches; yellowish brown (10YR 5/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, firm, very sticky and very plastic; many very fine and fine roots in cracks; few fine tubular and many fine and very fine interstitial pores; few fine tubular pores; 30 percent cobbles, 25 percent pebbles; thin

clay films on faces of peds; mildly alkaline (pH 8.0); abrupt smooth boundary. (2 to 7 inches thick)

2R—16 inches; fractured andesite.

**Type location:** Lander County, Nevada; about 8 miles northeast of Battle Mountain, approximately 1,500 feet south and 1,600 feet east of the northwest corner of sec. 15, T. 33 N., R. 46 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 43 to 47 degrees

*Mollic epipedon thickness:* 7 to 15 inches, generally includes the upper part of the argillic horizon

*Depth to bedrock:* 12 to 20 inches

*Reaction throughout the profile:* Slightly acid to mildly alkaline

#### A horizon:

Value—4 to 6 dry, less than 5.5 when the uppermost 7 inches is mixed; 2 or 3 moist

Chroma—2 or 3

Structure—weak or moderate, medium or thin platy, or very fine to medium granular or subangular blocky

#### Bt horizon:

Hue—7.5YR or 10YR; 5YR in some pedons having high iron concentrations in the parent material

Value—4 or 5 dry, 3 or 4 moist

Chroma—2 to 4

Texture—very gravelly clay, extremely gravelly clay, very cobbly clay, extremely cobbly clay; thin Bt1 horizon of very gravelly clay loam that is 35 to 40 percent clay in some pedons

Clay—40 to 55 percent

Rock fragments—40 to 65 percent pebbles and cobbles, generally increasing with depth

Structure—weak to strong, fine or medium angular or subangular blocky; platy

### Cherry Spring Series

The Cherry Spring series consists of moderately deep, well drained soils that formed in loess high in content of volcanic ash over alluvium derived from mixed rock sources. Cherry Spring soils are on fan piedmont remnants. Slopes are 2 to 8 percent. Mean annual precipitation is about 8 inches, and mean annual air temperature is about 46 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Haploxerollic Durargids

**Typical pedon:** Cherry Spring very fine sandy loam, 2 to 8 percent slopes, in an area of the Cherry Spring-Enko association:

A1—0 to 3 inches; light gray (10YR 7/2) very fine sandy loam, dark grayish brown (10YR 4/2) moist; strong thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 6 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) silt loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine tubular pores; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 6 inches thick)

Bt—7 to 13 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure that parts to moderate medium subangular blocky; hard, friable, sticky and plastic; many very fine and fine and few medium roots; many very fine tubular pores; 5 percent pebbles; few thin clay films on faces of peds; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 15 inches thick)

Btqk—13 to 29 inches; brownish yellow (10YR 6/6) silt loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few thin clay films on faces of peds; many very fine and fine roots; common very fine tubular pores; 10 percent pebbles; 40 percent durinodes less than 5 millimeters in size; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 15 inches thick)

2Bqkm—29 to 41 inches; very pale brown (10YR 7/4) strongly cemented duripan, yellowish brown (10YR 5/4) moist; 70 percent pebbles; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (5 to 15 inches thick)

2Bqk—41 to 60 inches; very pale brown (10YR 8/3) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 25 percent pebbles; 20 percent durinodes; common large lime seams, common fine lime concretions; bottom of pebbles coated with lime; violently effervescent; very strongly alkaline (pH 9.4).

**Type location:** Lander County, Nevada; about 20 miles northeast of Battle Mountain, approximately 1,700 feet west and 2,400 feet north of the southeast corner of sec. 36, T. 36 N., R. 46 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 51 degrees

*Combined thickness of A and Bt horizons:* 20 to 40 inches

*Depth to the strongly cemented duripan:* 20 to 40 inches

*Control section:* Clay—20 to 35 percent; texture—loam, silt loam, clay loam; rock fragments—0 to 15 percent

*Other features:* Substrata of contrasting textures below the duripan in some pedons

**A horizon:**

Value—5, 6, or 7 dry, greater than 5.5 when mixed; 3 or 4 moist

Chroma—2 or 3

Structure—weak to strong, thin to thick platy; subangular blocky; or massive

Reaction—neutral or mildly alkaline

**Bt horizon:**

Hue—10YR or 7.5YR

Chroma—3 to 6

Structure—weak or moderate, fine to coarse prismatic parting to subangular blocky

Reaction—mildly alkaline to strongly alkaline, becoming more alkaline with depth

**Btqk horizon:**

Hue—10YR or 7.5YR

Structure—subangular blocky; massive in some pedons

Reaction—mildly alkaline to strongly alkaline

Other features—weakly silica cemented or 20 to 40 percent durinodes in a friable matrix

Carbonates—few to many lime filaments or soft masses; slightly to violently effervescent

**Bqkm horizon:**

Reaction—moderately alkaline to very strongly alkaline

Other features—thin, discontinuous silica laminae in some pedons

**2Bk horizon (where present):**

Below the duripan in some pedons

Texture—stratified extremely gravelly sandy loam to sandy loam

## Chiara Series

The Chiara series consists of shallow, well drained soils that formed in alluvium derived from mixed rock sources with a loess mantle high in content of volcanic ash. Chiara soils are on summits and side slopes of fan piedmont remnants. Slopes are 2 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic shallow Xerollic Durorthids

**Typical pedon:** Chiara very fine sandy loam, 2 to 8 percent slopes, in an area of the Bioya-Chiara-Cortez association:

A1—0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 3/3) moist; moderate very thin platy and weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine and fine tubular and common fine vesicular pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 6 inches thick)

A2—2 to 5 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; strong thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 3 inches thick)

Bw—5 to 11 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and few medium and coarse roots; few fine tubular pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 7 inches thick)

Bqk—11 to 16 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine tubular pores; 20 percent weakly cemented durinodes; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (5 to 10 inches thick)

2Bqkm—16 to 26 inches; white (10YR 8/2) indurated duripan with continuous, very thin silica laminae; massive; extremely hard, very firm; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada; about 20 miles north of Battle Mountain, approximately 450 feet west and 600 feet north of the southeast corner of sec. 33, T. 36 N., R. 45 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 53 degrees F

*Depth to duripan:* 10 to 20 inches

*Control section:* Clay content—5 to 18 percent; texture—very fine sandy loam, loam, or silt loam, 70 to 85 percent silt plus very fine sand; rock

fragments—when mixed, up to 5 percent, mainly pebbles

*Other features:* Depth to lime—7 to 15 inches

*A horizon:*

Value—3 or 4 moist

Chroma—2 or 3

Structure—weak or moderate, very thin to thick platy, subangular blocky; massive in some pedons

Reaction—neutral to moderately alkaline

*Bw horizon:*

Value—6 or 7 dry, 3 to 5 moist

Chroma—3 or 4

Structure—weak to strong, fine to coarse subangular blocky; weak prismatic

Reaction—mildly alkaline to strongly alkaline

*Bqk horizon:*

Reaction—moderately alkaline or strongly alkaline

Cementation—contains from 20 to 60 percent weakly cemented and brittle durinodes 0.3 to 1 inch in diameter

*Bqkm horizon:*

Value—6 to 8 dry

Chroma—2 to 4

Structure—weak or moderate, thick platy; massive in some pedons

Other features—stratified gravelly and sandy substratum below a depth of 40 inches in some pedons

## Clanalpine Series

The Clanalpine series consists of moderately deep, well drained soils that formed in residuum and colluvium derived from rhyolitic and andesitic tuff. Clanalpine soils are on side slopes of mountains. Slopes are 30 to 75 percent. Mean annual precipitation is about 15 inches, and mean annual temperature is about 41 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Typic Argixerolls

**Typical pedon:** Clanalpine extremely cobbly loam, 30 to 50 percent slopes, in an area of the Itca-Clanlpine-Torro association, in Lander County, south part. Pebbles cover 20 percent, cobbles 40 percent, and stones 5 percent of the surface:

A1—0 to 4 inches; grayish brown (10YR 5/2) extremely cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine vesicular pores; 25 percent pebbles, 35

percent cobbles; neutral (pH 7.2); abrupt smooth boundary. (1 to 5 inches thick)

A2—4 to 9 inches; grayish brown (10YR 5/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine tubular pores; 10 percent pebbles, 10 percent cobbles; neutral (pH 7.2); clear wavy boundary. (4 to 9 inches thick)

Bt1—9 to 12 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium angular blocky structure; slightly hard, friable, sticky and plastic; common fine and medium roots; common fine tubular pores; common thin clay films on peds; 30 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (3 to 8 inches thick)

Bt2—12 to 22 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; hard, friable, very sticky and plastic; few medium roots; many very fine tubular pores; common moderately thick clay films on peds; 30 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); gradual wavy boundary. (4 to 12 inches thick)

Bt3—22 to 27 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and medium roots; common very fine tubular pores; common thin clay films on peds; 30 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (0 to 24 inches thick)

BC—27 to 38 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and nonplastic; few fine roots; common very fine interstitial pores; 40 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.6); abrupt irregular boundary. (0 to 15 inches thick)

2Cr—38 to 49 inches; weathered and highly fractured rhyolitic tuff; pockets containing some soil and roots.

**Type location:** Lander County, Nevada, south part; about 33 miles southwest of Austin, approximately 1,200 feet south and 800 feet west of the northeast corner of sec. 15, T. 17 N., R. 38 E. (part of the BLM private contract completed in Lander County)

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-July through mid-October



*Soil temperature:* 43 to 45 degrees F

*Mollic epipedon thickness:* 8 to 14 inches, including the Bt1 horizon in some pedons

*Solum thickness:* 20 to 40 inches

*Depth to the paralithic contact:* 20 to 40 inches

*Control section:* Clay content—25 to 35 percent; rock fragments—35 to 60 percent, mainly pebbles and cobbles

*Other features:* BC horizon overlying the paralithic contact in some pedons

**A horizon:**

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—weak or moderate, fine or medium subangular blocky

**Bt horizon:**

Value—6 or 7 dry, 4 or 5 moist; 5 dry and 3 moist in the upper part of some pedons

Chroma—3 or 4

Texture—very cobbly clay loam, very cobbly loam, very gravelly clay loam, or very gravelly loam

Structure—subangular blocky or angular blocky

Reaction—neutral or mildly alkaline

## Cleavage Series

The Cleavage series consists of shallow, well drained soils that formed in residuum or colluvium derived from rhyolite, welded tuff, chert, shale, quartzite, sandstone, or conglomerate and other igneous or sedimentary rocks. Cleavage soils are on crests and side slopes of mountains. Slopes are 4 to 75 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Argixerolls

**Typical pedon:** Cleavage very gravelly fine sandy loam, 4 to 15 percent slopes, in an area of the Softscrabble-Walti-Cleavage association, in Lander County, south part. Pebbles cover 60 percent and cobbles 10 percent of the soil surface:

A—0 to 4 inch; grayish brown (10YR 5/2) very gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure parting to moderate fine granular; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine vesicular pores; 30 percent pebbles, 10 percent cobbles; neutral (pH 7.2); abrupt smooth boundary. (1 to 9 inches thick)

BA—4 to 7 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard,

very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 25 percent pebbles, 10 percent cobbles; neutral (pH 7.2); clear wavy boundary. (0 to 6 inches thick)

Bt—7 to 15 inches; brown (10YR 5/3) extremely gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate fine and medium angular blocky structure; slightly hard, friable, sticky and plastic; few medium roots; common very fine tubular pores; common thin clay films on faces of peds; 50 percent pebbles, 20 percent cobbles; neutral (pH 7.2); clear smooth boundary. (7 to 12 inches thick)

2R—15 inches; rhyolite tuff.

**Type location:** Lander County, Nevada, south part; about 25 miles east of Austin, approximately 2,000 feet south and 2,800 feet east of the northwest corner of sec. 28, T. 17 N., R. 38 E. (part of the BLM private contract completed in Lander County)

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from July through October for 70 to 120 consecutive days

*Soil temperature:* 44 to 47 degrees F

*Mollic epipedon thickness:* 7 to 10 inches, not including Bt horizon

*Depth to bedrock:* 14 to 20 inches

*Control section:* Clay content—20 to 35 percent

*Rock fragments:* 50 to 80 percent, mostly pebbles or cobbles

*Reaction throughout the profile:* Neutral or mildly alkaline

**A horizon:**

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—platy, granular, subangular blocky

**BA horizon:**

Chroma—2 to 4

Texture—very cobbly loam or very gravelly loam

**Bt horizon:**

Hue—7.5YR or 10YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—very cobbly, extremely cobbly, very gravelly, or extremely gravelly clay loam; very gravelly sandy clay loam; very cobbly or very gravelly loam

Structure—subangular blocky or angular blocky; massive in some pedons

## Colbar Series

The Colbar series consists of moderately deep, well

drained soils that formed in residuum and colluvium derived from rhyolitic and andesitic rocks. Colbar soils are on foothills. Slopes are 8 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Xerollic Haplargids

**Typical pedon:** Colbar very cobbly loam, 30 to 50 percent slopes, strongly sloping, in an area of the Old Camp-Colbar-Rock outcrop association, steep. Pebbles cover 10 percent and cobbles 30 percent of the soil surface:

A—0 to 3 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 4/3) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; common very fine vesicular and tubular pores; 15 percent pebbles, 20 percent cobbles; moderately alkaline (pH 8.2); clear wavy boundary. (2 to 6 inches thick)

BA—3 to 8 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium and coarse roots; common very fine and fine tubular pores; 10 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 5 inches thick)

Bt—8 to 22 inches; yellowish brown (10YR 5/4) cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate very fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine and few medium and coarse roots; common very fine and fine tubular pores; many thin clay films in pores and on peds; 5 percent pebbles, 10 percent cobbles, 5 percent stones; moderately alkaline (pH 8.2); abrupt wavy boundary. (3 to 14 inches thick)

Bk—22 to 26 inches; yellowish brown (10YR 5/4) cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine and few medium and coarse roots; common very fine and fine tubular pores; 5 percent pebbles, 10 percent cobbles, and 5 percent stones; few slightly effervescent thin lime coatings on the undersides of rock fragments; noneffervescent matrix; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 16 inches thick)

2R—26 inches; fractured rhyolite ashflow tuff.

**Type location:** Lander County, Nevada; about 30 miles southwest of Battle Mountain, approximately 1,600

feet north and 1,700 feet east of the southwest corner of sec. 11, T. 26 N., R. 42 E.

### Range in Characteristics

*Soil moisture:* Dry during summer and autumn, moist in late winter and spring

*Soil temperature:* 48 to 52 degrees F

*Depth to bedrock:* 20 to 40 inches

*Thickness of A and Bt horizons:* 11 to 24 inches

*Control section:* Clay content—25 to 35 percent; rock fragments—15 to 35 percent, mainly pebbles and cobbles

*Other features:* Bk horizon that has thin lime coatings on undersides of rock fragments below the Bt horizon in some pedons

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak to moderate, very fine to medium subangular blocky or very thin to medium platy

Reaction—mildly alkaline or moderately alkaline

#### Bt horizon:

Value—5 or 6 dry, 3, 4, or 5 moist

Chroma—3 or 4

Structure—weak to strong, very fine to medium subangular blocky

Texture—cobbly loam, cobbly clay loam, or gravelly clay loam

Reaction—mildly alkaline or moderately alkaline

#### C or Bk horizon (where present):

Value—5, 6, or 7 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly loam or cobbly loam

## Cortez Series

The Cortez series consists of moderately deep, well drained soils that are moderately deep to an indurated duripan. These soils formed in thin loess deposits over alluvium derived from mixed volcanic and sedimentary rock sources. Cortez soils are on fan piedmonts. Slopes are 8 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Xerollic Nadurargids

**Typical pedon:** Cortez very fine sandy loam, 8 to 15 percent slopes, in an area of the Bioya-Chiara-Cortez association:

A1—0 to 3 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate thin

and medium platy structure; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; many very fine and fine vesicular pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 6 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and nonplastic; many very fine and few fine roots; common very fine tubular pores; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 8 inches thick)

A3—7 to 12 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate very thin and thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular pores; mildly alkaline (pH 7.8); abrupt smooth boundary. (0 to 8 inches thick)

2Bt—12 to 15 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to fine angular blocky; hard, firm, sticky and very plastic; common fine and very fine and few medium roots; common very fine tubular pores; few thin clay films on faces of peds and lining pores; 2 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 15 inches thick)

2Btk1—15 to 24 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to fine angular blocky; hard, firm, sticky and very plastic; common very fine and fine and few medium roots; few very fine tubular pores; 10 percent pebbles; slightly effervescent; continuous moderately thick clay films on faces of peds and lining pores; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 11 inches thick)

2Btk2—24 to 26 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine roots; few very fine tubular pores; common thin clay films on faces of peds and lining pores; 15 percent pebbles; strongly effervescent; common fine lime filaments, threads, and soft masses; strongly alkaline (pH 8.6); abrupt wavy boundary. (0 to 4 inches thick)

2Bqkm—26 to 60 inches; white (10YR 8/1) indurated duripan with a continuous, 3-millimeter-thick, laminar cap; very pale brown (10YR 7/4) moist; massive; extremely hard, extremely firm; violently effervescent.

**Type location:** Lander County, Nevada; about 22 miles northeast of Battle Mountain, approximately 1,200

feet south and 1,000 feet west of the northeast corner of sec. 16, T. 34 N., R. 46 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 50 degrees F

*Depth to the indurated duripan:* 22 to 36 inches

*Control section:* Clay content—40 to 50 percent when mixed; rock fragments—10 to 15 percent

*Other features:* An abrupt textural boundary between the A or BA and Bt horizons

#### A horizon:

Value—5 to 7 dry, greater than 5.5 when mixed to a depth of 7 inches; 3 or 4 moist

Chroma—2 or 3

Structure—moderate or strong, very thin to thick platy; massive in some pedons

Reaction—neutral to moderately alkaline

#### 2Bt and 2Btk horizons:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 to 5 moist

Chroma—2 to 4

Texture—clay, gravelly clay, or silty clay; thin subhorizons of clay loam in some pedons

Structure—moderate or strong, medium or coarse prismatic or columnar; subangular blocky, angular blocky, or massive lower part of the 2Btk horizon in some pedons

Reaction—mildly alkaline to strongly alkaline

Carbonates—common or many, fine or medium lime filaments and seams in lower part

#### Bqkm horizon:

Value—6 to 8 dry, 4 to 7 moist

Chroma—1 to 4

Other features—8 to more than 30 inches thick

#### C horizon (where present):

Texture—very gravelly coarse sandy loam, very cobbly loamy coarse sand

Other features—moderately or strongly saline-sodic

## Coztur Series

The Coztur series consists of shallow, well drained soils formed in residuum derived from volcanic and tuffaceous rocks. Coztur soils are on crests and side slopes of mountains and hills. Slopes are 2 to 15 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy, mixed, frigid Lithic Xerollic Haplargids

**Typical pedon:** Coztur loam, 2 to 8 percent slopes, in

an area of the Coztur-Genaw association. Pebbles cover 10 percent of the soil surface:

A1—0 to 3 inches; light brownish gray (10YR 6/2) loam, very dark grayish brown (10YR 3/2) moist; moderate thick platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common fine and medium vesicular pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 6 inches thick)

A2—3 to 7 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; common fine and medium tubular pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 4 inches thick)

BA—7 to 11 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; common fine and medium tubular pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 5 inches thick)

Bt—11 to 17 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common fine tubular pores; common thin clay films on peds and lining pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 7 inches thick)

R—17 inches; unweathered tuff.

**Type location:** Lander County, Nevada; about 38 miles southwest of Battle Mountain, approximately 1,270 feet south and 250 feet west of the northeast corner of sec. 16, T. 27 N., R. 41 E.

#### Range in Characteristics

*Soil moisture:* Dry in summer and fall, moist in winter and spring

*Soil temperature:* 43 to 46 degrees F

*Depth to bedrock:* 14 to 20 inches

*Reaction throughout the profile:* Neutral to mildly alkaline

#### A horizon:

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

#### BA horizon:

Hue—2.5Y or 10YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 to 4

#### Bt horizon:

Hue—2.5Y or 10YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 to 4

Clay content—22 to 35 percent

Texture—loam or clay loam

Rock fragments—less than 15 percent, mainly pebbles

### Creemon Series

The Creemon series consists of very deep, well drained soils that formed mainly in silty alluvium of mixed rock sources and in some volcanic ash and loess. Creemon soils are on fan skirts, inset fans, lagoons, and fan aprons. Slopes are 0 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-silty, mixed, mesic Duric Camborthids

**Typical pedon:** Creemon silt loam, 0 to 2 percent slopes:

A1—0 to 6 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; strong thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine and few fine roots; many fine vesicular and very fine tubular pores; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 7 inches thick)

A2—6 to 10 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and plastic; many very fine and few fine roots; many very fine tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 5 inches thick)

Bw—10 to 15 inches; very pale brown (10YR 7/3) silt loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and few fine roots; common very fine tubular pores; strongly alkaline (pH 8.6); abrupt irregular boundary. (4 to 8 inches thick)

Bqk1—15 to 21 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine tubular pores; 25 percent 10- to 25-millimeter, weak durinodes; 50 percent discontinuous, hard, firm, brittle, weakly silica-cemented lenses 1 to 6 inches thick; strongly effervescent; common fine lime filaments; strongly alkaline (pH 8.6); clear wavy boundary. (4 to 12 inches thick)

**Bqk2**—21 to 28 inches; very pale brown (10YR 7/3) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and slightly plastic; many very fine and few fine and medium roots; common very fine tubular pores; 35 percent 20- to 35-millimeter, weak and moderately strong durinodes; common fine lime filaments; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (5 to 16 inches thick)

**Bqk3**—28 to 45 inches; very pale brown (10YR 7/3) and yellowish brown (10YR 5/4) silt loam, dark yellowish brown (10YR 4/4) and brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and few fine and medium roots; few very fine tubular pores; 25 percent 15- to 30-millimeter, weak and moderately strong durinodes; few fine lime filaments; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (8 to 18 inches thick)

**C**—45 to 62 inches; light yellowish brown (10YR 6/4) gravelly very fine sandy loam, dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky and slightly plastic; common very fine roots; common very fine interstitial and tubular pores; 15 percent 2- to 30-millimeter, flat and rounded pebbles; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; approximately 40 miles southwest of Battle Mountain, about 2,400 feet north and 1,250 feet east of the southwest corner of sec. 15, T. 26 N., R. 43 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in part for short periods from October through May

**Soil temperature:** 48 to 52 degrees F

**Thickness of A and Bw horizons:** 11 to 15 inches

**Depth to Bqk horizon:** 11 to 20 inches

**Control section:** Clay content—8 to 18 percent; texture—silt loam to very fine sandy loam

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Other features:** Lenses of volcanic ash in the lower part of the profiles in some pedons; as much as 20 percent pebbles below a depth of 40 inches and a continuous, weakly silica-cemented layer at a depth of 40 to 55 inches in some pedons; normally moderately or strongly salt and sodium affected below a depth of 20 to 30 inches but moderately or strongly affected throughout in some pedons; a Bq horizon between the Bw and Bqk horizons in some pedons

**A horizon:**

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Consistence—soft or slightly hard, nonsticky or slightly sticky, slightly plastic or plastic

Other features—noneffervescent or slightly effervescent

**Bw horizon:**

Value—6 or 7 dry

Chroma—2 to 4

Structure—thin platy; massive in some pedons

Consistence—soft or slightly hard, nonsticky or slightly sticky, nonplastic or slightly plastic

**Bqk horizons:**

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 to 4

Consistence—soft or slightly hard, nonsticky or slightly sticky

Other features—strongly or violently effervescent; 20 to 40 percent durinodes; 3- to 10-inch-thick horizon that has 20 to 60 percent discontinuous weakly silica-cemented lenses at a depth of 11 to 29 inches in many pedons

### Cren Series

The Cren series consists of very deep, well drained soils that formed in silty alluvium derived from mixed rock sources with an admixture of volcanic ash. Cren soils are on fan skirts and inset fans. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-silty, mixed (calcareous), mesic Durorthidic Torriorthents

**Typical pedon:** Cren silt loam:

**A**—0 to 7 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate very thin and thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine, fine, and medium vesicular and very fine interstitial and tubular pores; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 8 inches thick)

**Bk1**—7 to 18 inches; light gray (2.5Y 7/2) silt loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine interstitial and tubular pores; violently effervescent; common fine filaments of secondary carbonates; 2 percent small weak durinodes; strongly alkaline (pH 8.6); gradual smooth boundary. (6 to 12 inches thick)

**Bk2**—18 to 26 inches; light gray (10YR 7/2) silt loam,

brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; 2 percent weak durinodes; violently effervescent; few fine filaments of secondary carbonates; strongly alkaline (pH 8.6); abrupt smooth boundary. (5 to 10 inches thick)

**Bqk1**—26 to 29 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine interstitial and tubular pores; 30 percent weak discontinuous silica-cemented lenses; 2 percent small durinodes; violently effervescent; common medium filaments of secondary carbonates; strongly alkaline (pH 8.8); abrupt smooth boundary. (3 to 10 inches thick)

**Bqk2**—29 to 49 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; few fine horizontal lenses of volcanic ash; 30 percent weak, 5- to 15-millimeter durinodes; violently effervescent; few fine filaments of secondary carbonates; strongly alkaline (pH 8.8); clear wavy boundary. (15 to 25 inches thick)

**Bqk3**—49 to 60 inches; pale brown (10YR 6/3) silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and plastic; many very fine roots; many very fine tubular pores; 20 percent 10- to 30-millimeter, weak and moderately strong durinodes; violently effervescent; common fine filaments of secondary carbonates; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; approximately 62 miles southwest of Battle Mountain, about 2,700 feet west and 2,200 feet south of the northeast corner of sec. 34, T. 25 N., R. 40 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in part for short periods from October through May

**Soil temperature:** 48 to 53 degrees F

**Depth to Bqk horizon:** 15 to 30 inches

**Control section:** Clay content—8 to 18 percent; texture—averages silt loam with less than 15 percent fine sand or coarser particles

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Other features:** Lenses of volcanic ash in the lower part of the profile in some pedons

**A horizon:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—platy or prismatic; massive in some pedons

**Bk horizon:**

Value—5 to 7 dry

Chroma—2 to 4

Texture—silt loam that has thin strata of very fine sandy loam or fine sandy loam in some pedons

Consistence—soft or slightly hard dry, nonsticky or slightly sticky wet

**Bqk horizon:**

Value—5 to 7 dry

Chroma—2 to 4

Texture—silt loam that has thin strata of very fine sandy loam or fine sandy loam in some pedons

Cementation—20 to 40 percent weak or moderately strongly cemented durinodes; 3- to 10-inch-thick horizon that is 20 to 50 percent discontinuous and weakly silica-cemented at a depth of 15 to 30 inches

Consistence—soft or slightly hard dry, nonsticky or slightly sticky wet

### Davey Series

The Davey series consists of very deep, somewhat excessively drained soils that formed in alluvium derived from mixed rock sources. Davey soils are on sand sheets and fan skirts. Slopes are 0 to 4 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Xerollic Camborthids

**Typical pedon:** Davey fine sandy loam:

**A**—0 to 5 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate thin and medium platy; slightly hard, very friable, nonsticky and slightly plastic; common very fine random and few fine horizontal roots; many very fine vesicular, interstitial, and tubular pores; neutral (pH 6.8); clear wavy boundary. (4 to 8 inches thick)

**Bw**—5 to 13 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine random and common fine and medium oblique and horizontal roots; common very fine vesicular, interstitial, and tubular pores; mildly alkaline (pH

- 7.4); clear wavy boundary. (3 to 16 inches thick)
- C—13 to 20 inches; light gray (10YR 7/2) loamy fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine random and very few fine and medium oblique roots; common very fine vesicular and interstitial and few very fine tubular pores; 3 percent rounded, 2- to 10-millimeter pebbles; slightly effervescent; strongly alkaline (pH 7.6); clear wavy boundary. (0 to 12 inches thick)
- Ck1—20 to 29 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine random and very few fine and few medium oblique roots; common very fine vesicular and interstitial pores; 3 percent rounded, 2- to 10-millimeter pebbles; few fine lime filaments; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (8 to 40 inches thick)
- Ck2—29 to 41 inches; very pale brown (10YR 7/3) loamy fine sand, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine random and very few fine and medium oblique and vertical roots; common very fine vesicular and interstitial pores; 2 percent 5- to 10-millimeter, weak and very weak durinodes; 10 percent 2- to 30-millimeter, flat and rounded pebbles coated with lime on upper surfaces; common fine lime filaments; strongly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (0 to 20 inches thick)
- Ck3—41 to 60 inches; very pale brown (10YR 7/3) loamy fine sand, yellowish brown (10YR 5/4) moist; few fine faint brownish yellow (10YR 6/6 moist) mottles; massive; soft, very friable, nonsticky and nonplastic; few very fine random and very few fine vertical roots; common very fine vesicular and interstitial pores; 10 percent 5- to 30-millimeter, weak and very weak durinodes; 5 percent rounded, 2- to 30-millimeter pebbles coated with lime on upper surfaces; slightly effervescent matrix; strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada; about 15 miles northwest of Battle Mountain, approximately 60 feet south and 2,900 feet west of the northeast corner of sec. 9, T. 34 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 53 degrees F

**Thickness of A and Bw horizons:** 11 to 23 inches

**Depth to lime:** 11 to 24 inches

**Control section:** Clay content—5 to 10 percent; rock

fragments—up to 30 percent in any one horizon, averages less than 15 percent

**Gypsum:** Gypsum crystals below a depth of 20 inches in some pedons

**Cementation:** Continuous weak or strong silica-cemented horizons below a depth of 50 inches in some pedons

**Other features:** Unconformable very fine sandy loam or silt loam strata below a depth of 40 inches in some pedons

#### A horizon:

Hue—10YR or 2.5Y

Value—5 to 7 dry, greater than 5.5 when the uppermost 7 inches is mixed; 3 to 6 moist

Chroma—1 to 3

Reaction—neutral or mildly alkaline

#### Bw horizon:

Hue—10YR or 2.5Y

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 to 4

Texture—loam, fine sandy loam, sandy loam; gravelly sandy loam subhorizons in some pedons

Structure—prismatic; massive in some pedons

Reaction—neutral to moderately alkaline

#### C and Ck horizons:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 to 6 moist

Chroma—2 to 4

Texture—fine sand, loamy fine sand, and loamy sand; thin strata of fine sandy loam or coarse sand in some pedons

Reaction—moderately alkaline or strongly alkaline

Carbonates—slightly effervescent to violently effervescent in the Ck horizon; few or common segregated lime filaments or partial coatings on rock fragments

Cementation—up to 10 percent weakly cemented durinodes below a depth of 20 inches

Mottles—relict mottles below a depth of 40 inches in some pedons

### Desatoya Series

The Desatoya series consists of very deep, well drained soils that formed in alluvium derived from mixed sources. Desatoya soils are on fan piedmont remnants. Slopes are 8 to 50 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Clayey over loamy-skeletal, montmorillonitic, mesic Durixerollic Haplargids

**Typical pedon:** Desatoya very gravelly loam, 8 to 15 percent slopes, in an area of the Desatoya-Pineval-Grassval association, in Lander County, south part. Pebbles cover 50 percent of the soil surface:

**A**—0 to 3 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, very friable, sticky and plastic; few very fine roots; many very fine vesicular pores; 35 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (2 to 5 inches thick)

**Bt1**—3 to 6 inches; brown (10YR 5/3) gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and very plastic; common very fine and fine roots; many very fine interstitial pores; few thin clay films bridging sand grains and on faces of peds; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (0 to 4 inches thick)

**Bt2**—6 to 10 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to moderate medium angular blocky; hard, friable, very sticky and very plastic; common very fine, fine, and medium roots; common very fine interstitial and tubular pores; many thin and common moderately thick clay films on faces of peds; 30 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (4 to 12 inches thick)

**Btk**—10 to 14 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, very sticky and very plastic; common very fine and fine and few medium roots; few very fine tubular and interstitial pores; common thin clay films on faces of peds; 30 percent pebbles; common fine lime concretions; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 4 inches thick)

**Bqk1**—14 to 23 inches; very pale brown (10YR 7/3) very gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; hard, firm, nonsticky and nonplastic; few fine and medium roots; few very fine tubular pores; 40 percent pebbles; 30 percent discontinuous strongly silica-cemented masses; many fine lime concretions; weak continuous silica cementation; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (9 to 40 inches thick)

**Bqk2**—23 to 38 inches; very pale brown (10YR 8/3) very gravelly sandy loam, very pale brown (10YR 7/4) moist; massive; hard, firm, nonsticky and

nonplastic; common very fine and fine roots; many very fine interstitial pores; 55 percent pebbles; 20 percent discontinuous strongly silica-cemented lenses and 20 percent horizontal lenses of very gravelly loamy sand 1 or 2 inches thick; many fine lime concretions and seams; weak continuous silica cementation; violently effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 20 inches thick)

**Bqk3**—38 to 60 inches; very pale brown (10YR 8/3) very gravelly loamy sand, very pale brown (10YR 7/4) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 55 percent pebbles; 30 percent discontinuous strongly silica-cemented masses; many fine lime concretions and seams; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** Lander County, Nevada, south part; about 28 miles west of Austin, approximately 2,000 feet east and 1,000 feet south of the northwest corner of sec. 10, T. 18 N., R. 39 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 48 to 52 degrees F

*Depth to weak cementation:* 14 to 20 inches

*Depth to carbonates:* 10 to 20 inches

#### A horizon:

Value—5 or 6 dry, 3 to 5 moist

Chroma—2 or 3

Structure—weak or moderate subangular blocky or platy

Reaction—neutral or mildly alkaline

#### Bt horizon:

Value—5 or 6 dry, 3 to 5 moist

Chroma—3 or 4

Texture—gravelly clay loam or gravelly clay

Clay content—35 to 45 percent

Rock fragments—20 to 30 percent, mainly pebbles

Structure—moderate or strong, fine or medium subangular blocky

Reaction—mildly alkaline or moderately alkaline

#### Bqk horizon:

Texture—extremely gravelly sandy loam to very gravelly loamy sand, averages very gravelly or extremely gravelly sandy loam

Clay content—8 to 18 percent

Rock fragments—40 to 80 percent, mainly pebbles

Consistence—hard or very hard dry, firm to slightly brittle moist

Reaction—moderately to very strongly alkaline



Cementation—continuous weakly silica cemented; discontinuously weak or strongly silica-cemented subhorizons below a depth of 38 inches

### **Dewar Series**

The Dewar series consists of shallow, well drained soils that formed mainly in loess and silty alluvium derived from mixed rock sources and in some volcanic ash. Dewar soils are on fan piedmont remnants and mountain valley fan remnants. Slopes are 2 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Dewar gravelly loam, 2 to 8 percent slopes, in Lander County, south part:

- A1—0 to 2 inches; light brownish gray (10YR 6/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very thick platy structure; slightly sticky and slightly plastic; many very fine and few fine vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (2 to 5 inches thick)
- A2—2 to 4 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and common very fine roots; many very fine interstitial pores; 10 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 3 inches thick)
- Bt—4 to 8 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and medium roots; common fine interstitial pores; common thin clay films on peds and bridging mineral grains; 15 percent pebbles; mildly alkaline (pH 7.6); gradual wavy boundary. (4 to 14 inches thick)
- Btqk—8 to 14 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and plastic; common fine and medium and few coarse roots; common fine interstitial pores; common thin clay films on peds; 15 percent 5- to 15-millimeter, moderately cemented durinodes; 15 percent pebbles, 5 percent cobbles and pan fragments; few fine soft lime masses; noneffervescent matrix; mildly alkaline (pH 7.8); abrupt wavy boundary. (0 to 8 inches thick)

Bqkm—14 to 50 inches; very pale brown (10YR 7/3) indurated duripan, yellowish brown (10YR 5/4) moist; strong medium and thick platy structure; extremely hard, extremely firm; few roots along horizontal fractures; continuous, 2- to 6-millimeter-thick, brown (10YR 5/3) silica laminae on upper surface and in horizontal bands throughout horizon, sometimes alternating with thin, strongly or weakly cemented strata; violently effervescent; moderately alkaline (pH 8.6).

**Type location:** Lander County, Nevada, south part; about 12 miles east of Austin, approximately 750 feet east and 2,200 feet north of the southwest corner of sec. 12, T. 19 N., R. 45 E. (part of the BLM private contract completed in Lander County)

### **Range in Characteristics**

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Reaction throughout the profile:* A and Bt horizons are neutral to moderately alkaline

*Depth to indurated duripan:* 13 to 20 inches

*A horizon:*

Chroma—2 or 3

Structure—moderate or strong, very thin to thick platy or fine or medium granular

*Bt horizon:*

Value—6 or 7 dry, 3 or 4 moist

Chroma—2, 3, or 4 dry, 3 or 4 moist

Texture—gravelly silty clay loam, gravelly clay loam, or cobbly silty clay loam

Clay content—27 to 35 percent

Rock fragments—15 to 30 percent, mainly pebbles and cobbles

Structure—weak to strong, fine to coarse subangular blocky

*Btqk horizon (where present):*

Clay content—15 to 27 percent

Durinodes—weak or very weak, less than 30 percent

Cementation—discontinuous or continuous weakly silica cemented in some pedons

*Bqkm horizon:*

Structure—massive or thick or very thick platy

Cementation—alternately strongly cemented or discontinuously indurated below the duripan in some pedons

Other features—a 1- to 3-inch zone of degraded duripan material common along the upper boundary in some pedons

*Ck horizon:*

Common below a depth of 40 inches in some pedons

### **Doowak Series**

The Doowak series consists of very deep, excessively drained soils that formed in alluvium derived from mixed rock sources. Doowak soils are on inset fans. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Xeric Torriorthents

**Typical pedon:** Doowak very gravelly loamy sand, 0 to 2 percent slopes, in an area of the Zineb-Doowak-Oxcurel association:

A—0 to 6 inches; grayish brown (10YR 5/2) very gravelly loamy sand, very dark grayish brown (10YR 3/2) moist; moderate medium and thick platy structure; soft, very friable, nonsticky and nonplastic; common fine and few very fine roots; many very fine vesicular pores; 40 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary. (4 to 6 inches thick)

Bw—6 to 18 inches; grayish brown (10YR 5/2) extremely gravelly sand, very dark grayish brown (10YR 3/2) moist; lithochromic colors; single grained; loose, nonsticky and nonplastic; common fine and few medium roots; many very fine interstitial pores; 65 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (10 to 25 inches thick)

Bk1—18 to 33 inches; grayish brown (10YR 5/2) extremely gravelly loamy sand, very dark grayish brown (10YR 3/2) moist; lithochromic colors; single grained; loose, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; 70 percent pebbles; very thin lime coatings on undersides of pebbles; slightly effervescent; moderately alkaline (pH 8.0); gradual smooth boundary. (10 to 15 inches thick)

Bk2—33 to 48 inches; grayish brown (10YR 5/2) extremely gravelly loamy sand, very dark grayish brown (10YR 3/2) moist; lithochromic colors; single grained; loose, nonsticky and nonplastic; common very fine and fine and few medium roots; many very fine interstitial pores; 75 percent pebbles, 2 percent cobbles; very thin lime coatings on undersides of rock fragments; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (10 to 15 inches thick)

Bk3—48 to 60 inches; grayish brown (10YR 5/2) extremely gravelly sand, very dark grayish brown (10YR 3/2) moist; lithochromic colors; single grained; loose, nonsticky and nonplastic; many very

fine interstitial pores; 60 percent pebbles, 5 percent cobbles; very thin lime coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; approximately 18 miles south of Battle Mountain, about 1,000 feet north and 1,000 feet west of the southeast corner of sec. 9, T. 29 N., R. 44 E.

#### **Range in Characteristics**

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Control section:** Clay content—3 to 8 percent; rock fragments—60 to 80 percent, mainly pebbles; texture—extremely gravelly sand to extremely gravelly loamy sand

**Reaction:** mildly alkaline or moderately alkaline

**A horizon:**

Value—5 or 6 dry

**Bk horizon:**

Effervescence—slightly to strongly effervescent

### **Duffer Series**

The Duffer series consists of very deep, poorly drained soils that formed in silty alluvium derived from mixed rock sources with an admixture of volcanic ash. Duffer soils are on flood plain remnants. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Fine-silty, carbonatic, mesic Aquic Calciorthids

**Typical pedon:** Duffer very fine sandy loam:

A1—0 to 2 inches; light brownish gray (2.5Y 6/2) very fine sandy loam, olive brown (2.5Y 4/4) moist; weak thick platy structure; hard, friable, nonsticky and nonplastic; very few very fine random roots; many very fine vesicular, interstitial, and tubular pores; up to 1/8-inch-thick salt crust on surface; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 4 inches thick)

A2—2 to 4 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 5/3) moist; weak thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine random roots; common very fine vesicular, interstitial, and tubular pores; weakly cemented by salts; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 2 inches thick)

Bw1—4 to 11 inches; light gray (10YR 7/2) silty clay loam, brown (10YR 4/3) moist; common medium

distinct yellowish brown (10YR 5/4) mottles; weak very thin and thin platy structure; slightly hard, very friable, very sticky and very plastic; many very fine random and common fine and medium horizontal and oblique roots; many very fine interstitial and tubular pores; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 10 inches thick)

**Bw2**—11 to 18 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and plastic; few very fine random roots; many very fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (4 to 14 inches thick)

**Bk1**—18 to 29 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; common fine distinct yellowish brown (10YR 5/4) and few fine faint dark yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) mottles; massive; slightly hard, friable, sticky and plastic; common very fine random and very few fine oblique roots; many very fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (6 to 11 inches thick)

**Bk2**—29 to 36 inches; light gray (10YR 7/1) silt loam, light brownish gray (10YR 6/2) moist; common fine distinct dark brown (7.5YR 4/4 moist) mottles; massive; slightly hard, friable, sticky and plastic; few very fine random roots; many very fine and fine tubular pores; about 25 percent 15- to 30-millimeter, irregularly shaped lime concretions; common medium lime filaments and threads; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (7 to 31 inches thick)

**Bk3**—36 to 60 inches; light gray (10YR 7/1) silty clay loam, light brownish gray (10YR 6/2) moist; common fine distinct yellowish brown (10YR 5/4) and very dark grayish brown (10YR 3/2) and dark yellowish brown (10YR 4/4) mottles; weak very thin platy structure; hard, firm, sticky and plastic; very few very fine random roots; many very fine and fine tubular pores; 15 percent 15- to 30-millimeter, irregularly shaped silica and lime concretions; few medium lime filaments and threads; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 7 miles south of Battle Mountain, approximately 1,300 feet north and 300 feet west of the southeast corner of sec. 20, T. 31 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Saturated between depths of 20 to 40 inches in early spring, usually moist from capillary

moisture from ground water, dry periods in summer and autumn

**Soil temperature:** 47 to 52 degrees F

**Depth to the calcic horizon:** 12 to 29 inches

**Control section:** Clay content—20 to 35 percent; texture—silt loam or silty clay loam

**Reaction throughout the profile:** Strongly or very strongly alkaline, moderately alkaline in some parts of some pedons

**Other features:** Generally strongly saline-sodic in the uppermost 20 to 30 inches unless reclaimed

#### A horizon:

Hue—10YR to 5YR

Value—5 to 7 dry, 3 to 5 moist

Chroma—1 to 4

#### Bw horizon:

Hue—10YR or 2.5Y

Value—4 or 5 moist

Chroma—2 to 4

Structure—weak or moderate, very fine to medium granular or very thin to medium platy; massive in the lower part of some pedons

#### Bk horizon:

Hue—10YR to 5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—1 to 4

Structure—subangular blocky; massive in some pedons

Calcium carbonate equivalent—40 to 60 percent

#### 2C horizon (where present):

Hue—10YR to 5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—1 to 4

Texture—stratified very fine sandy loam to silty clay loam

Clay content—15 to 30 percent

### Dun Glen Series

The Dun Glen series consists of very deep, well drained soils that formed in mixed alluvium with a loess mantle high in content of volcanic ash. Dun Glen soils are on fan skirts and inset fans. Slopes are 0 to 4 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Typic Camborthids

**Typical pedon:** Dun Glen gravelly loam, 2 to 4 percent slopes, in an area of the Oxcorel-Whirlo-Dun Glen association. Pebbles cover 25 percent of the soil surface:

- A—0 to 4 inches; pale brown (10YR 6/3) gravelly loam, dark grayish brown (10YR 4/2) moist; moderate thin and medium platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine vesicular and common fine interstitial pores; 15 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 5 inches thick)
- Bw—4 to 11 inches; pale brown (10YR 6/3) very fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate very fine and fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.2); gradual smooth boundary. (6 to 10 inches thick)
- Bk1—11 to 18 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 5 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (4 to 10 inches thick)
- Bk2—18 to 26 inches; light yellowish brown (10YR 6/4) gravelly fine sandy loam, brown (10YR 4/3) moist; massive; hard, friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 20 percent pebbles; few fine lime filaments; violently effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (8 to 36 inches thick)
- Bk3—26 to 32 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 5 percent pebbles; few fine lime filaments; violently effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (0 to 15 inches thick)
- Bk4—32 to 36 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 5 percent pebbles; few fine lime filaments; violently effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (0 to 15 inches thick)
- Bk5—36 to 44 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 10 percent pebbles; few fine lime filaments; violently effervescent; strongly alkaline (pH 8.6); gradual wavy boundary. (0 to 10 inches thick)
- Bqk—44 to 60 inches; pale brown (10YR 6/3) fine sandy loam, dark yellowish brown (10YR 4/4) moist;

massive; hard, firm, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 10 percent weak to strong discontinuous silica and lime cementation; 10 percent pebbles; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 20 miles south of Battle Mountain, at a site approximately 1,320 feet east and 1,000 feet north of the southwest corner of sec. 27, T. 29 N., R. 44 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 53 degrees F

*Control section:* Texture—fine sandy loam, very fine sandy loam, or loam, 15 to 35 percent fine sand or coarser; clay content—9 to 14 percent; rock fragments—as much as 10 percent when mixed

*Other features:* Up to 15 percent hard and firm durinodes in some pedons

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Reaction—mildly alkaline or moderately alkaline

#### Bw horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—very fine sandy loam or silt loam

Rock fragments—as much as 10 percent, mainly pebbles

Reaction—mildly alkaline or moderately alkaline

#### Bk horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Clay content—9 to 14 percent

Rock fragments—5 to 30 percent

Reaction—moderately alkaline to very strongly alkaline

Other features—gravel below a depth of 40 inches in some pedons

### Dunphy Series

The Dunphy series consists of very deep, somewhat poorly drained soils formed in alluvium of some volcanic ash but mainly of volcanic sources. Dunphy soils are on alluvial flats. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Dunphy very fine sandy loam, 0 to 2

percent slopes, in an area of the Soolake-Dunphy-Argenta association:

- A—0 to 6 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many fine vesicular pores; very strongly alkaline (pH 9.6); clear smooth boundary. (0 to 15 inches thick)
- Cq1—6 to 18 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine and fine tubular pores; 20 percent hard, firm durinodes; strongly effervescent; very strongly alkaline (pH 9.6); abrupt wavy boundary. (5 to 20 inches thick)
- Cq2—18 to 34 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine and fine tubular pores; 20 percent hard, firm durinodes; strongly effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary. (0 to 20 inches thick)
- 2Cq3—34 to 40 inches; very pale brown (10YR 8/3) fine sandy loam, pale brown (10YR 6/3) moist; few fine faint light yellowish brown (10YR 6/4) mottles; massive; hard, firm, nonsticky and nonplastic; continuous weakly silica cemented; common fine manganese stains; strongly effervescent; very strongly alkaline (pH 9.6); clear smooth boundary. (2 to 12 inches thick)
- 3Cq4—40 to 54 inches; very pale brown (10YR 8/3) very fine sandy loam, pale brown (10YR 6/3) moist; few fine faint light yellowish brown (10YR 6/4) mottles; massive; slightly hard, friable, nonsticky and slightly plastic; common very fine and fine roots; many very fine and fine tubular pores; 50 percent hard, firm durinodes; common thin magnesium stains; strongly effervescent; strongly alkaline (pH 9.6); clear smooth boundary. (0 to 16 inches thick)
- 4Cqkm—54 to 60 inches; very pale brown (10YR 8/3) strongly silica-cemented duripan; violently effervescent.

**Type location:** Lander County, Nevada; about 18 miles north of Battle Mountain and approximately 1,900 feet west and 1,600 feet north of the southeast corner of sec. 19, T. 35 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Dry in midsummer and early fall, moist mid-October through mid-July; apparent seasonal water table between a depth of 2.5 to 3.5 feet from

early spring through early summer; drained phases are recognized

**Depth to Cq horizon:** 6 to 17 inches

**Control section:** Clay content—10 to 15 percent when mixed; texture—gravelly sand to silty clay loam but dominantly very fine sandy loam, silt loam, or fine sandy loam

**Profile colors:**

Hue—10YR to 5Y

Value—6 to 8 dry, 4 to 6 moist

**Profile reaction:** Moderately alkaline to very strongly alkaline, becoming less alkaline with depth

**Mottles:** Iron mottles that have high chroma and yellowish hue and dark manganese mottles below a depth of 6 inches in most pedons

**Other features:** Thin strata of volcanic ash up to 4 inches thick in some pedons; strongly cemented duripans at a depth of 40 to 60 inches in some pedons

**A horizon:**

Structure—weak or moderate, very fine or fine granular or very thin to medium platy; massive in some pedons

Consistence—soft to very hard dry; very hard only in areas that are strongly sodium affected; never hard or very hard where massive

Effervescence—noneffervescent to violent

**C and Cq horizons:**

Consistence—weakly silica-cemented horizons hard to extremely hard dry; noncemented horizons friable or very friable moist

Effervescence—effervescent throughout except for thin strata of volcanic ash in some pedons

Cementation—continuous weakly silica-cemented horizons interstratified with horizons that lack silica accumulation or contains durinodes in a friable or very friable matrix

### Enko Series

The Enko series consists of very deep, well drained soils that formed mainly from mixed rock sources and in loamy alluvium, weathered loess, and volcanic ash. Enko soils are on inset fans, fan aprons, and fan skirts. Slopes are 2 to 8 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Enko very fine sandy loam, 2 to 8

percent slopes, in an area of the Cherry Spring-Enko association:

- A1—0 to 2 inches; light brownish gray (2.5Y 6/2) very fine sandy loam, brown (10YR 4/3) moist; moderate thin and medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular and interstitial pores; neutral (pH 7.2); clear smooth boundary. (2 to 7 inches thick)
- A2—2 to 7 inches; very pale brown (10YR 7/3) loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular and interstitial pores; mildly alkaline (pH 7.6); clear wavy boundary. (0 to 5 inches thick)
- Bw—7 to 15 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (6 to 20 inches thick)
- Bqk1—15 to 23 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; 5 percent 2- to 5-millimeter, strongly cemented durinodes; common very fine and few fine roots; common very fine tubular pores; common medium lime filaments and threads; 1 percent pebbles; weak continuous silica cementation; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (5 to 12 inches thick)
- Bqk2—23 to 60 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; 5 percent 2- to 5-millimeter, strongly cemented durinodes; few very fine roots; few very fine tubular pores; common medium lime filaments and threads; 1 percent pebbles; weak continuous silica cementation; strongly effervescent; strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada; about 26 miles north of Battle Mountain at a site approximately 2,250 feet north and 2,000 feet east of the southwest corner of sec. 3, T. 35 N., R. 46 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 49 to 52 degrees F

*Thickness of A and Bw horizons:* 12 to 30 inches

*Depth to weak continuous cementation:* 14 to 30 inches

*Control section:* Clay content—10 to 18 percent; rock fragments—0 to 15 percent pebbles

*Other features:* Sandy substrata or substrata containing gypsum crystals below a depth of 40 inches in some pedons; noneffervescent Bq horizon above the Bqk horizon in some pedons

#### A horizon:

Hue—10YR or 2.5Y

Value—commonly 6 or 7 dry, 5 dry in some subhorizons of some pedons, 3 or 4 moist

Chroma—2 or 3

Structure—very fine and fine granular; very thin to medium platy; or massive

Consistence—slightly sticky or sticky, slightly plastic or plastic

Reaction—neutral to moderately alkaline

#### Bw horizon:

Value—5 or 7 dry, 3 to 5 moist

Chroma—2, 3, or 4

Texture—mainly loam, fine sandy loam, or sandy loam; strata of silt loam or clay loam in the upper part in some pedons

Structure—prismatic, angular blocky, subangular blocky; massive in some pedons

Consistence—nonsticky, slightly sticky, or sticky, nonplastic, slightly plastic, or plastic

Reaction—neutral to moderately alkaline, becoming more alkaline with depth

Carbonates—some pedons are calcareous in the lower part of the horizon

#### Bqk horizon:

Hue—10YR, 2.5Y, 5Y

Value—4 to 7 moist

Chroma—1 to 4 dry, 2 to 4 moist

Texture—loam, sandy loam, fine sandy loam

Silica cementation—continuous weakly silica-cemented horizons 10 to 40 inches thick; subhorizons not continuously weakly silica cemented 20 to 50 percent durinodes or subhorizons 20 to 75 percent discontinuously weakly silica cemented

Reaction—mildly alkaline to strongly alkaline, becoming more alkaline with depth

*Other features*—relict iron mottles or mica particles in many pedons; very gravelly or extremely gravelly substratum phases below a depth of 40 inches in some pedons

#### Filiran Series

The Filiran series consists of moderately deep, well drained soils formed in alluvium of some loess but mainly of volcanic and metamorphic rocks. Filiran soils are on fan piedmonts. Slopes are 2 to 8 percent. Mean

annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic  
Haploxerollic Nadurargids

**Typical pedon:** Filiran silt loam, 2 to 4 percent slopes, in an area of the Filiran-Pineval-Kingingham association, in Lander County, south part. Pebbles cover 10 percent of the soil surface:

- A1—0 to 3 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; many very fine and fine vesicular pores; 10 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary. (2 to 4 inches thick)
- A2—3 to 7 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and medium roots; common very fine and medium tubular pores; 5 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (3 to 6 inches thick)
- E—7 to 9 inches; light brownish gray (10YR 6/2) gravelly silt loam, dark brown (10YR 4/3) moist; weak thick platy structure; hard, friable, slightly sticky and slightly plastic; common very fine and medium roots; common very fine and fine tubular pores; 15 percent pebbles, 5 percent cobbles; 20 percent white (10YR 8/2) bleached faces of peds; moderately alkaline (pH 8.0); abrupt wavy boundary. (1 to 2 inches thick)
- E/B—9 to 12 inches; pale brown (10YR 6/3) gravelly silt loam, dark brown (10YR 3/3) moist; strong fine subangular blocky structure; hard, firm, sticky and plastic; common very fine and fine and few medium roots; common very fine and fine tubular pores; common thick clay films on faces of peds; 15 percent pebbles, 5 percent cobbles; 60 percent white (10YR 8/2) bleached faces of peds; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 4 inches thick)
- 2Btn—12 to 20 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; very hard, very firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many thick clay films on faces of peds and in pores; 5 percent pebbles; slightly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (7 to 13 inches thick)
- 2Btnc—20 to 28 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4)

moist; weak medium prismatic structure parting to strong fine angular blocky; very hard, very firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many thick clay films on faces of peds and in pores; 20 percent pebbles; common lime coatings on undersides of rock fragments; common medium threads and filaments of secondary carbonates; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (4 to 8 inches thick)

2Btncqy—28 to 33 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; common thick clay films on faces of peds and in pores; 20 percent weak discontinuous silica cementation; 25 percent pebbles, 5 percent cobbles; many medium filaments of secondary carbonates; common medium soft masses of gypsum; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (3 to 7 inches thick)

2Bqkm—33 to 60 inches; pale brown (10YR 6/3) strongly cemented duripan, dark brown (10YR 4/3) moist; massive; very hard, very firm; disseminated lime; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada, south part; approximately 25 miles north of Austin, about 2,000 feet north and 150 feet west of the southeast corner of sec. 16, T. 23 N., R. 44 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-June through October

**Soil temperature:** 47 to 52 degrees F

**Depth to duripan:** 20 to 40 inches

**Depth to carbonates:** 12 to 25 inches

**Control section:** Clay content—35 to 50 percent; rock fragments—5 to 20 percent when mixed, mainly pebbles

**A horizon:**

Value—3 or 4 moist

Chroma—2 or 3

**E horizon:**

Value—3 or 4 moist

Chroma—2 or 3

Structure—platy, subangular blocky, or prismatic

Other features—15 to 60 percent of faces of peds are bleached

**Btn horizon:**

Hue—10YR or 2.5Y

Value—4, 5, or 6 dry, 3, 4, or 5 moist  
 Chroma—3 or 4  
 Texture—clay, gravelly clay, silty clay, clay loam, or silty clay loam  
 Exchangeable sodium—15 to 35 percent  
 Carbonates—none to slightly effervescent in the upper part; strongly effervescent to violently effervescent in the lower part  
 Reaction—strongly alkaline or very strongly alkaline

### **Floer Series**

The Floer series consists of deep, well drained soils that formed in residuum and colluvium of some loess but mainly of basalt, chert, and other rocks. Floer soils are on side slopes of mountains and foothills. Slopes are 8 to 15 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 43 F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Aridic Palexerolls

**Typical pedon:** Floer gravelly silt loam, 8 to 15 percent slopes, in an area of the Floer-Slaven-Roca association. Pebbles cover 30 percent and cobbles and stones 5 percent of the soil surface:

A1—0 to 3 inches; grayish brown (10YR 5/2) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; weak very thin and thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common medium roots; common very fine tubular pores; 15 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); abrupt wavy boundary. (2 to 3 inches thick)

A2—3 to 12 inches; grayish brown (10YR 5/2) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and medium roots; common very fine tubular and interstitial pores; 15 percent pebbles, 2 percent cobbles; moderately alkaline (pH 8.0); abrupt wavy boundary. (3 to 9 inches thick)

Bt1—12 to 15 inches; brown (10YR 4/3) very cobbly silty clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; common thin clay films on faces of peds; about 20 percent pebbles, 25 percent cobbles, and 5 percent stones; moderately alkaline (pH 8.0); abrupt wavy boundary. (1 to 3 inches thick)

Bt2—15 to 21 inches; dark yellowish brown (10YR 4/4) very cobbly clay, dark brown (10YR 3/3) moist;

strong medium and coarse prismatic structure parting to strong medium subangular blocky; very hard, very firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; continuous moderately thick clay films on faces of peds and lining pores; 25 percent pebbles, 25 percent cobbles, and 5 percent stones; moderately alkaline (pH 8.0); abrupt wavy boundary. (3 to 6 inches thick)

Btk1—21 to 26 inches; dark yellowish brown (10YR 4/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; strong fine and medium subangular blocky structure; hard, firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 20 percent pebbles, 25 percent cobbles; strongly effervescent; common fine soft lime filaments; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 10 inches thick)

Btk2—26 to 50 inches; yellowish brown (10YR 5/6) very cobbly clay, yellowish brown (10YR 5/6) moist; moderate medium subangular blocky structure; hard, friable, very sticky and very plastic; few very fine roots; common very fine tubular pores; common thin clay films on faces of peds and lining pores; 20 percent pebbles, 30 percent cobbles, and 5 percent stones; strongly effervescent; common fine soft lime filaments; moderately alkaline (pH 8.4); abrupt wavy boundary. (4 to 25 inches thick)

R—50 inches; fractured chert.

**Type location:** Lander County, Nevada; in the Hilltop Canyon area, approximately 1,320 feet north and 600 feet east of the southwest corner of sec. 5, T. 29 N., R. 46 E.

### **Range in Characteristics**

**Soil moisture:** Usually dry, but moist in part from November through July

**Soil temperature:** 42 to 47 degrees F

**Mollic epipedon thickness:** 10 to 20 inches, includes the upper part of the Bt horizon

**Depth to bedrock:** 40 to 60 inches

**Depth to carbonates:** 20 to 40 inches, slight or strong effervescence

**Control section:** Clay content—50 to 65 percent

**Profile reaction:** Neutral to moderately alkaline, becoming more alkaline with depth

**Secondary carbonates:** Common fine segregated lime filaments, slightly to strongly effervescent

**A horizon:**

Value—4 or 5 dry, 2 or 3 moist

Structure—weak to strong, very thin to thick platy or very fine to coarse subangular blocky



**Bt horizon:**

- Value—2 or 3 moist
- Chroma—2 or 3 in the upper part and 3 or 4 in the lower part
- Texture—very gravelly, very stony, or very cobbly silty clay loam in the thin upper subhorizon; very cobbly clay or very stony clay in lower subhorizons
- Rock fragments—20 to 30 percent pebbles and 20 to 40 percent cobbles and stones

**Btk horizon:**

- Hue—7.5YR or 10YR
- Value—4, 5, or 6 dry, 3, 4, or 5 moist
- Chroma—4 to 8
- Texture—extremely stony clay loam, extremely stony clay, or very cobbly clay, when mixed
- Rock fragments—20 to 30 percent pebbles and 20 to 40 percent cobbles and stones

**Genaw Series**

The Genaw series consists of shallow, well drained soils that formed in loess mantled residuum derived from tuffaceous sediments. Genaw soils are on rolling hills and rock pediments. Slopes are 4 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Genaw very fine sandy loam, 4 to 15 percent slopes, in an area of the Genaw-Perlor-Puett association. Pebbles cover 5 percent and cobbles 5 percent of the soil surface:

- A1—0 to 3 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; weak medium platy structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine and fine roots; many very fine and fine vesicular pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 7 inches thick)
- A2—3 to 6 inches; brown (10YR 5/3) gravelly very fine sandy loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine, fine, and medium roots; common fine and medium tubular and interstitial pores; 15 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 4 inches thick)
- Bt—6 to 11 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; slightly

hard, very friable, sticky and plastic; common very fine, fine, and medium roots; few very fine tubular pores; common fine and medium clay films on faces of peds and lining pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 7 inches thick)

- Bkq—11 to 16 inches; very pale brown (10YR 7/3) very gravelly loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; few very fine tubular pores; 35 percent pebbles; common fine and medium lime filaments; 10 percent weak durinodes; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (2 to 5 inches thick)
- Cr—16 inches; soft tuffaceous sediments.

**Type location:** Lander County, Nevada; about 26 miles southwest of Battle Mountain, about 800 feet north and 2,400 feet west of the southeast corner of sec. 6, T. 27 N., R. 42 E.

**Range in Characteristics**

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to paralithic contact:** 14 to 20 inches

**A horizon:**

- Value—5 or 6 dry, 3 or 4 moist
- Chroma—2 or 3

**Bt horizon:**

- Value—5 or 6 dry, 3 or 4 moist
- Chroma—3 or 4
- Texture—loam or clay loam
- Rock fragments—15 to 35 percent, mainly pebbles
- Clay content—18 to 30 percent

**Bkq horizon:**

- Value—6 or 7 dry, 4 or 5 moist
- Chroma—3 or 4
- Texture—sandy loam or loam
- Rock fragments—25 to 50 percent, mainly pebbles
- Cementation—5 to 15 percent weak discontinuous cementation or weakly cemented durinodes
- Reaction—Moderately alkaline or strongly alkaline

**Ginex Series**

The Ginex series consists of shallow, well drained soils that formed in residuum derived from sedimentary rock. Ginex soils are on side slopes of hills. Slopes are 30 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Ginex very gravelly sandy loam, 30 to 50 percent slopes, in an area of the Ginex-Burrita-Burrita, south aspect, association. Pebbles cover 50 percent and cobbles 5 percent of the soil surface:

A—0 to 2 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 30 percent pebbles, 5 percent cobbles; slightly effervescent; mildly alkaline (pH 7.8); abrupt smooth boundary. (2 to 4 inches thick)

Btk1—2 to 4 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine granular structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine interstitial pores; common thin clay films bridging sand grains; 30 percent pebbles; common thin lime coatings on undersides of rock fragments; strongly effervescent; mildly alkaline (pH 7.8); clear wavy boundary. (0 to 3 inches thick)

Btk2—4 to 7 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium angular blocky structure; slightly hard, very friable, sticky and plastic; common fine and medium roots; common very fine interstitial pores; common thin clay films bridging sand grains; 45 percent pebbles; common thin lime coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 8 inches thick)

Cr—7 inches; highly fractured, moderately weathered shale.

**Type location:** Lander County, Nevada; approximately 28 miles south of Battle Mountain, about 2,500 feet east and 2,100 feet north of the projected southwest corner of sec. 1, T. 25 N., R. 43 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Depth to paralithic contact:* 5 to 14 inches

*Control section:* Clay content—18 to 30 percent; rock fragments—35 to 50 percent when mixed, mainly pebbles

*Reaction throughout the profile:* Mildly alkaline or moderately alkaline, becoming more alkaline with depth

*A horizon:*

Hue—7.5YR, 10YR, or 2.5Y

Value—5 or 6 dry, 3 or 4 moist

Effervescence—noneffervescent or slightly effervescent

*Btk horizon:*

Hue—5YR, 7.5YR, 10YR, or 2.5Y

Value—5 to 7 dry, 3 to 5 moist

Chroma—3 to 6

Texture—averages very gravelly loam or very gravelly sandy clay loam

Effervescence—slightly effervescent or strongly effervescent

Carbonates—thin coatings on undersides of pebbles or fine filaments and threads

### Glean Series

The Glean series consists of deep, well drained soils that formed in colluvium and residuum derived from mixed rocks including metamorphic rocks, basalt, and andesite. Glean soils are on side slopes of mountains. Slopes are 30 to 75 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Pachic Haploxerolls

**Typical pedon:** Glean gravelly loam, 30 to 50 percent slopes, in an area of the Glean-Walti-Cleavage association. Pebbles cover 20 percent and stones less than 1 percent of the soil surface:

A1—0 to 6 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate medium platy structure parting to moderate medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular pores; 30 percent pebbles; neutral (pH 7.0); abrupt smooth boundary. (1 to 14 inches thick)

A2—6 to 19 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine tubular pores; 35 percent pebbles; neutral (pH 7.0); clear wavy boundary. (0 to 14 inches thick)

AC—19 to 31 inches; dark brown (10YR 4/3) very gravelly loam, very dark brown (10YR 2/2) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine tubular pores; 35 percent pebbles, 10 percent

cobbles; neutral (pH 7.2); clear wavy boundary. (10 to 15 inches thick)

- C—31 to 49 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; few very fine tubular pores; 35 percent pebbles, 10 percent cobbles; neutral (pH 7.2); abrupt smooth boundary. (6 to 23 inches thick)
- 2R—49 inches; altered andesite.

**Type location:** Lander County, Nevada; approximately 24 miles south of Battle Mountain, about 1,550 feet south and 500 feet east of the northwest corner of sec. 29, T. 28 N., R. 45 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist from November through mid-July

*Soil temperature:* 43 to 47 degrees F

*Mollic epipedon thickness:* 22 to 39 inches

*Depth to bedrock:* 40 to 60 inches

*Control section:* Texture—very gravelly sandy loam or very cobbly loam; rock fragments—40 to 70 percent, mainly pebbles and cobbles

*Reaction throughout the profile:* Slightly acid or neutral

*A horizon:*

Value—4 or 5 dry

Chroma—2 or 3

*C horizon:*

Hue—7.5YR, 10YR, or 2.5Y

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 to 4

### Golconda Series

The Golconda series consists of moderately deep, well drained soils that formed in mixed alluvium with a mantle of loess high in content of volcanic ash. Golconda soils are on fan piedmonts. Slopes are 2 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Haplic Nadurargids

**Typical pedon:** Golconda very fine sandy loam, 2 to 8 percent slopes, in an area of the Golconda-Blownout land complex:

- A1—0 to 4 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; strong thick and very thick platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and common fine vesicular pores; 10 percent pebbles; moderately alkaline (pH

8.2); clear smooth boundary. (3 to 7 inches thick)

- A2—4 to 8 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; strong medium and thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine vesicular and few very fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 8 inches thick)

- Bt<sub>nk</sub>1—8 to 13 inches; brown (10YR 5/3) clay loam, dark yellowish brown (10YR 4/4) moist; strong fine and medium prismatic structure; hard, firm, sticky and plastic; many very fine and few fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 5 percent pebbles; many fine soft lime patches on faces of peds; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (3 to 5 inches thick)

- Bt<sub>nk</sub>2—13 to 20 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong fine and medium prismatic structure; hard, firm, sticky and plastic; many very fine and few fine roots; many very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 5 percent pebbles; thin lime coatings on undersides of pebbles; many fine, soft lime patches on faces of peds; violently effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (5 to 15 inches thick)

- Bt<sub>nk</sub>3—20 to 27 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/6) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; many very fine roots; few very fine tubular pores; common thin clay films on faces of peds and lining pores; 30 percent pebbles; thin lime coatings on undersides of pebbles; many fine soft lime patches on faces of peds; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (0 to 8 inches thick)

- Bq<sub>km</sub>—27 to 43 inches; pale brown (10YR 6/3) strongly silica-cemented duripan, dark yellowish brown (10YR 4/4) moist; massive; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (10 to 20 inches thick)

- Cq<sub>k</sub>—43 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; massive; very hard, firm, nonsticky and nonplastic; many very fine interstitial pores; 75 percent pebbles; weak continuous cementation with discontinuous strata of strong cementation 2 or 3 inches thick; violently effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; about 12 miles southwest of Battle Mountain, approximately 2,500 feet north and 1,000 feet west of the southeast corner of sec. 6, T. 30 N., R. 43 E.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from May through October

*Soil temperature:* 47 to 52 degrees F

*Depth to duripan:* 20 to 40 inches

*Depth to segregated lime:* 8 to 15 inches

*Other features:* BA or BC horizon, or both, in some pedons

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Reaction—mildly alkaline or moderately alkaline

#### Bt<sub>nk</sub> horizon:

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 to 6

Texture—gravelly clay loam, clay loam, or silty clay loam

Clay content—27 to 35 percent

Rock fragments—5 to 35 percent, mainly pebbles

Structure—prismatic, subangular blocky in the lower subhorizons of some pedons

Reaction—moderately alkaline to very strongly alkaline

Other features—20 to 50 percent exchangeable sodium; noneffervescent in the upper part in some pedons

#### B<sub>qk</sub> horizon (above the duripan in some pedons):

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 6

#### B<sub>qkm</sub> horizon:

Value—6, 7, or 8 dry, 5 or 6 moist

Chroma—3 or 4

Rock fragments—5 to 45 percent, mainly pebbles

Structure—platy; massive in some pedons

Consistence—very hard or extremely hard dry

Other features—discontinuous lenses of indurated material in some pedons

#### B<sub>qk</sub> horizon:

Texture—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam

Other features—loose to weakly cemented pebbles in most pedons

## Goldrun Series

The Goldrun series consists of very deep, somewhat

excessively drained soils that formed in eolian sands derived from mixed rock sources with some influence from volcanic ash. Goldrun soils are on sand dunes and sand sheets. Slopes are 0 to 30 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Mixed, mesic Xeric Torripsamments

**Typical pedon:** Goldrun fine sand, 0 to 4 percent slopes, in an area of the Davey-Goldrun complex:

- A—0 to 7 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine random and very few fine oblique roots; many very fine vesicular and interstitial pores; neutral (pH 7.2); clear smooth boundary. (5 to 9 inches thick)
- C1—7 to 12 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine random and very few fine oblique roots; many very fine interstitial pores; neutral (pH 7.2); clear wavy boundary. (5 to 20 inches thick)
- C2—12 to 18 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine random and very few fine oblique roots; many very fine interstitial and few very fine tubular pores; thin silica coatings bridging sand grains; neutral (pH 7.2); clear wavy boundary. (6 to 20 inches thick)
- C3—18 to 30 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine random roots; common very fine interstitial and tubular pores; about 2 percent 2- to 25-millimeter, rounded pebbles; neutral (pH 7.2); gradual smooth boundary. (0 to 28 inches thick)
- C4—30 to 35 inches; light gray (10YR 7/2) loamy fine sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and slightly plastic; few very fine random roots; common very fine interstitial pores; neutral (pH 7.4); clear smooth boundary. (0 to 15 inches thick)
- 2Ck—35 to 60 inches; very pale brown (10YR 7/3) fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; very few very fine random roots; common very fine interstitial pores; about 2 percent 2- to 25-millimeter, rounded pebbles; few fine lime filaments; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; about 16.5 miles north of Battle Mountain, approximately 1,000 feet north and 100 feet east of the southwest corner of sec. 33, T. 35 N., R. 45 E.

**Range in Characteristics**

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees

*Depth to lime:* 17 to 35 inches

*Control section:* Texture—dominantly fine sand that has strata of coarse sand, loamy sand, or loamy fine sand in some pedons; clay content—1 to 8 percent

*Other features:* Some pedons have horizons that have less than 15 percent durinodes or weak discontinuous silica bridging mineral grains

*A horizon:*

Reaction—neutral to moderately alkaline

*C horizon:*

Reaction—neutral to moderately alkaline

*2Ck horizon:*

Reaction—moderately alkaline or strongly alkaline

Other features—slightly or strongly effervescent

**Graley Series**

The Graley series consists of shallow, well drained soils that formed in residuum and colluvium derived from mixed rock sources. Graley soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Graley very gravelly sandy loam, 30 to 50 percent slopes, in an area of the Graley-Loncan-Bregar association. Pebbles cover 30 percent and cobbles 5 percent of the surface:

A1—0 to 1 inch; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 40 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (1 to 7 inches thick)

A2—1 to 7 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; many very fine roots; many very fine interstitial pores; 30 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary. (2 to 8 inches thick)

Bt—7 to 14 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; many very fine roots; many fine and medium interstitial and common very

fine tubular pores; 40 percent pebbles, 15 percent cobbles; common moderately thick clay films on faces of peds, lining pores, and on rock fragments; mildly alkaline (pH 7.6); abrupt wavy boundary. (3 to 10 inches thick)

2R—14 inches; fractured chert.

**Type location:** Lander County, Nevada; approximately 30 miles southeast of Battle Mountain, about 1,500 feet east and 2,100 feet south of the northwest corner of sec. 14, T. 30 N., R. 46 E.

**Range in Characteristics**

*Soil moisture:* Usually moist, dry from mid-July through late October

*Soil temperature:* 42 to 47 degrees F

*Mollic epipedon thickness:* 7 to 12 inches, does not include the argillic horizon

*Depth to bedrock:* 14 to 20 inches

*Control section:* Clay content—35 to 50 percent; rock fragments—35 to 60 percent, mainly pebbles; texture—very gravelly clay loam or very gravelly clay

*Reaction throughout the profile:* Neutral or mildly alkaline

*A horizon:*

Value—4 or 5 dry

Chroma—2 or 3

*Bt horizon:*

Hue—7.5YR or 10YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Structure—angular or subangular blocky

Consistence—very hard or hard dry

**Graley Variant**

The Graley Variant consists of shallow, well drained soils that formed in residuum and colluvium derived from chert. Graley Variant soils are on side slopes of mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Graley Variant very gravelly loam, 15 to 50 percent slopes, in an area of the Slaven-Wiskan-Graley Variant association:

A1—0 to 2 inch; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular and few very fine vesicular pores;

35 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (1 to 4 inches thick)

A2—2 to 7 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 35 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 8 inches thick)

Bt1—7 to 9 inches; yellowish brown (10YR 5/4) very gravelly clay loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; common very fine and few fine roots; few very fine tubular pores; few thin clay films on faces of peds and lining pores; 30 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 4 inches thick)

Bt2—9 to 15 inches; yellowish brown (10YR 5/4) very gravelly clay, brown (10YR 4/3) moist; strong fine subangular blocky structure; hard, firm, sticky and very plastic; few very fine roots; few very fine tubular pores; common thin clay films on faces of peds and lining pores; 40 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (5 to 12 inches thick)

2R—15 inches; fractured chert.

**Type location:** Lander County, Nevada; approximately 18 miles southeast of Battle Mountain, about 1,000 feet north and 500 feet east of the southwest corner of sec. 21, T. 29 N., R. 46 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 44 to 47 degrees F

*Mollic epipedon thickness:* 7 to 12 inches, does not include the argillic horizon

*Depth to bedrock:* 14 to 20 inches

*Control section:* Clay content—35 to 50 percent; rock fragments—40 to 60 percent, mainly pebbles and cobbles; texture—very gravelly clay loam or very gravelly clay

*A horizon:*

Value—4 or 5 dry

Chroma—2 or 3

*Bt horizon:*

Value—5 or 6 dry, 3 or 4 moist

### Grassval Series

The Grassval series consists of shallow, well drained soils that formed in alluvium derived from mixed rock sources. Grassval soils are on fan piedmont remnants. Slopes are 2 to 15 percent. Mean annual precipitation is

about 9 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Grassval fine sandy loam, 8 to 15 percent slopes, in an area of the Grassval-Oxcorel association, in Lander County, south part. Gravel covers 10 percent of the soil surface:

A—0 to 4 inches; light brownish gray (10YR 6/2) fine sandy loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; few fine and very fine roots; few medium and many fine vesicular pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 5 inches thick)

Bt—4 to 10 inches; pale brown (10YR 6/3) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few medium and coarse and common fine roots; common fine and very fine tubular pores; common thin clay films on peds; 20 percent pebbles, 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (4 to 7 inches thick)

Btk—10 to 13 inches; light yellowish brown (10YR 6/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate medium and coarse subangular blocky structure; hard, friable, sticky and plastic; common fine roots; common fine tubular pores; common thin clay films on faces of peds; 20 percent pebbles, 5 percent cobbles; lime coatings on undersides of pebbles and many fine and medium soft masses; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (2 to 5 inches thick)

Bqkm—13 to 60 inches; white (10YR 8/1) indurated duripan with weakly or strongly cemented thin horizontal lenses; violently effervescent.

**Type location:** Lander County, Nevada, south part; approximately 10 miles east of Austin in the northern part of Smokey Valley, about 1,950 feet north and 1,900 feet west of the southeast corner of sec. 25, T. 19 N., R. 45 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 50 degrees F

*Solum thickness and depth to duripan:* 8 to 14 inches

*Carbonates:* Calcareous throughout, effervescence increasing with depth; segregated lime common in lower part of the solum

*Control section:* Clay content—18 to 27 percent; rock fragments—15 to 35 percent, mainly pebbles

*A horizon:*

Value—3 or 4 moist

Chroma—2 or 3

Reaction—mildly alkaline or moderately alkaline

*Bt horizon:*

Value—4 or 5 moist

Chroma—3 or 4

Texture—gravelly loam or gravelly clay loam

Clay content—25 to 35 percent

Structure—prismatic or subangular blocky

Reaction—moderately alkaline or strongly alkaline

## Grina Series

The Grina series consists of shallow, well drained soils that formed in residuum weathered from soft sedimentary bedrock. Grina soils are on low rolling hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 10 inches, and mean annual air temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents

**Typical pedon:** Grina gravelly loam, 15 to 30 percent slopes, in an area of the Grina-Grina, eroded-Caniwe association. Pebbles cover 40 percent of the soil surface:

A1—0 to 3 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common fine vesicular and tubular pores; strongly effervescent; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 4 inches thick)

A2—3 to 5 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots; few fine tubular and fine interstitial pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 6 inches thick)

A3—5 to 11 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (0 to 6 inches thick)

C—11 to 15 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; soft, friable, slightly sticky and slightly plastic; common fine interstitial pores; 10 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (4 to 12 inches thick)

Cr—15 inches; soft tuffaceous sediments with fractures 5 to 10 inches apart.

**Type location:** Lander County, Nevada; about 40 miles south of Battle Mountain, 1,400 feet north and 1,300 feet east of the southwest corner of sec. 8, T. 25 N., R. 46 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Depth to paralithic contact:* 14 to 20 inches

*Control section:* Clay content—20 to 35 percent when mixed; texture—loam, silt loam, or silty clay loam; rock fragments—0 to 15 percent when mixed

*Carbonate equivalent:* 20 to 40 percent by weight of the less than 20-millimeter fraction

*Other features:* Thin Bk horizon immediately above the paralithic contact in some pedons

*A horizon:*

Hue—10YR or 2.5Y

Value—5 or 6 dry, 3 or 4 moist

Structure—very fine or fine granular; very thin to very thick platy; or subangular blocky

Consistence—soft to hard dry, very friable or friable moist, slightly sticky or sticky and slightly plastic or plastic wet

*C horizon:*

Hue—10YR or 2.5Y

Value—6, 7, or 8 dry, 5, 6, or 7 moist

Chroma—2, 3, or 4

Structure—weak or moderate, very fine to medium subangular blocky, very fine or fine angular blocky, or very thin to thick platy; massive in some pedons

Effervescence—strongly effervescent or violently effervescent

*Cr horizon:*

Hue—10YR to 5Y

Value—7 or 8 dry, 5 to 7 moist

Chroma—2 or 3

Consistence—soft sedimentary material; hard to extremely hard dry, firm to very firm moist

*Other features*—precipitated secondary carbonates or gypsum filaments or threads and iron and manganese stains along fracture planes in many pedons

## Gund Series

The Gund series consists of very deep, somewhat poorly drained soils that formed in silty alluvium derived mainly from loess, volcanic ash, and mixed rock sources over lacustrine sediments. Gund soils are on lake plains and lake plain remnants. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature about 47 degrees F.

**Taxonomic class:** Fine-silty over clayey, mixed, nonacid, mesic Aquic Durorthidic Torriorthents

**Typical pedon:** Gund silt loam, in an area of the Gund-Umberland association, in Lander County, south part:

A—0 to 4 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate thin and medium platy structure; soft, very friable, sticky and slightly plastic; common very fine and fine roots; many very fine interstitial and vesicular pores; strongly alkaline (pH 8.7); gradual smooth boundary. (3 to 6 inches thick)

Cq1—4 to 14 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate thin and medium platy structure; hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 40 percent weak discontinuous silica cementation; strongly alkaline (pH 9.0); gradual smooth boundary. (6 to 12 inches thick)

Cq2—14 to 23 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; moderate thin and medium platy structure; hard, firm, brittle, slightly sticky and nonplastic; few very fine to coarse roots; common very fine tubular pores; weak continuous silica cementation; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (6 to 12 inches)

2C—23 to 38 inches; light gray (2.5Y 7/2) clay, light brownish gray (2.5Y 6/2) moist; common medium distinct olive yellow (2.5Y 6/6 moist) mottles; strong medium prismatic structure; hard, friable, sticky and very plastic; few very fine, fine, and medium roots; many very fine and fine interstitial and tubular pores; continuous moderately thick pressure faces; 60 percent of the faces of peds, pores, and root channels coated with reddish brown (5YR 4/4) iron and manganese stains; strongly effervescent; strongly alkaline (pH 8.9); clear wavy boundary. (10 to 20 inches thick)

2Cy—38 to 60 inches; pale yellow (5Y 7/3) silty clay, light olive gray (5Y 6/2) moist; many medium distinct olive yellow (2.5Y 6/6 moist) mottles; massive; hard, friable, very sticky and plastic; few very fine roots; many very fine tubular pores;

common fine white (10YR 8/1) gypsum crystals; strongly effervescent; strongly alkaline (pH 9.0).

**Type location:** Lander County, Nevada, south part; approximately 55 miles southeast of Battle Mountain, about 1,600 feet north and 1,260 feet west of the southeast corner of sec. 19, T. 23 N., R. 48 E. (part of the BLM private contract completed in Lander County)

### Range in Characteristics

**Soil moisture:** Usually moist in some part of the soil moisture control section from October through July, usually dry in August and September; apparent seasonal high water table at a depth of 3.0 to 3.5 feet from late winter to early summer; drained phases are recognized

**Soil temperature:** 47 to 52 degrees F

**Depth to weak silica cementation:** 3 to 6 inches

**Depth to unconformable lacustrine sediments:** 15 to 30 inches

**Control section:** Clay content—averages 18 to 25 percent in the upper part and 45 to 60 percent in the lower part; texture—silt loam in the upper part over silty clay or clay in the lower part

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

#### A horizon:

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 or 3

Effervescence—commonly noneffervescent but slightly effervescent in some pedons

Salt and sodium—strongly salt and sodium affected, concentrations decrease with increasing depth

Other features—a thin A2 horizon, a 2Cg horizon, or both in some pedons

#### Cq horizon:

Value—6 or 7 dry, 4 to 6 moist

Chroma—3 or 4

Cementation—30 to 60 percent discontinuous weak silica cementation in the upper part and continuous weak in the lower part

Effervescence—commonly noneffervescent, but ranges to strongly effervescent in the upper subhorizons and strongly effervescent in the lower subhorizons

#### 2C horizon:

Hue—2.5Y or 10YR in the upper part and 2.5Y or 5Y in the lower part

Value—7 or 8 dry in the upper part, 6 or 7 dry in the lower part, 5 or 6 moist

Chroma—2 or 3

Mottles and stains—iron and manganese stains coating 50 to 70 percent of the peds, pores, and



root channels; common or many distinct or prominent mottles  
 Segregated gypsum—few to many crystals in the 2Cy horizon

### **Handy Series**

The Handy series consists of very deep, well drained soils that formed in alluvium derived from igneous rocks. Handy soils are on mountain valley fans, fan piedmonts, and ballenas. Slopes are 4 to 30 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Xerollic Haplargids

**Typical pedon:** Handy loam, 4 to 8 percent slopes, in an area of the Handy-Caniwe-Zoesta association. Pebbles cover 20 percent of the soil surface:

- A1—0 to 3 inches; light brownish gray (10YR 6/2) loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common fine vesicular pores; 10 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 6 inches thick)
- A2—3 to 6 inches; light brownish gray (10YR 6/2) fine sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 6 inches thick)
- BA—6 to 9 inches; light brownish gray (10YR 6/2) loam, dark brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 8 inches thick)
- Bt—9 to 17 inches; brown (10YR 5/3) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; extremely hard, very firm, very sticky and very plastic; few fine roots; few fine tubular pores; many thick clay films on peds; 10 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 14 inches thick)
- Btk1—17 to 23 inches; brown (10YR 5/3) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; very hard, very firm, very sticky and very plastic; few fine roots; few fine tubular pores; many thick clay films on peds; 20

percent pebbles; few seams of secondary carbonates; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 21 inches thick)

Btk2—23 to 38 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; few fine tubular pores; few moderately thick clay films on peds; 20 percent pebbles; many lime seams; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 20 inches thick)

Bk—38 to 60 inches; very pale brown (10YR 7/3) gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; few very fine roots; very few fine tubular pores; common very fine very dark gray (10YR 3/1) manganese stains; 25 percent pebbles; common lime seams; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; about 40 miles south of Battle Mountain, approximately 350 feet south and 2,000 feet west of the northeast corner of sec. 29, T. 25 N., R. 46 E.

### **Range in Characteristics**

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 45 to 47 degrees F

**Control section:** Clay content—40 to 50 percent; rock fragments—0 to 30 percent, mainly pebbles

**Depth to lime:** 12 to 23 inches

**Depth to Bk horizon:** 20 to 40 inches

**A horizon:**

Value—4 to 6 dry, greater than 5.5 when the uppermost 7 inches is mixed; 3 or 4 moist

Chroma—2 or 3

Structure—granular or thin to thick platy

Reaction—neutral or mildly alkaline

**Bt and Btk horizons:**

Hue—10YR or 7.5YR, 5YR in some pedons

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 to 4

Texture—clay or gravelly clay

Structure—moderate or strong angular blocky or prismatic

Reaction—neutral to moderately alkaline, commonly becoming more alkaline with depth

**Bk horizon:**

Texture—gravelly loam to very gravelly loamy sand

Rock fragments—15 to 60 percent, mainly pebbles

Other features—strongly or violently effervescent

Reaction—moderately alkaline or strongly alkaline

## Hapgood Series

The Hapgood series consists of very deep, well drained soils that formed mainly in colluvium derived from volcanic rocks and in loess and volcanic ash. Hapgood soils are on side slopes of mountains. Slopes are 15 to 75 percent. Mean annual precipitation is about 16 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Pachic Cryoborolls

**Typical pedon:** Hapgood gravelly loam, 30 to 50 percent slopes, in an area of the Newlands-Packer-Hapgood association, moderately steep, in Lander County, south part. Pebbles cover 10 percent of the soil surface:

- A1—0 to 7 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; many very fine and fine and few medium and coarse roots; many very fine interstitial pores; 20 percent pebbles; neutral (pH 6.8); diffuse wavy boundary. (0 to 8 inches)
- A2—7 to 17 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and plastic; many very fine and fine and few medium and coarse roots; many very fine interstitial pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 6.8); gradual wavy boundary. (4 to 12 inches thick)
- A3—17 to 33 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine and few medium and coarse roots; common very fine and fine interstitial pores; 30 percent pebbles, 15 percent cobbles; neutral (pH 6.8); gradual wavy boundary. (0 to 20 inches thick)
- AC—33 to 40 inches; yellowish brown (10YR 5/4) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; few very fine and fine interstitial pores; 30 percent pebbles, 15 percent cobbles; neutral (pH 6.8); clear wavy boundary. (0 to 12 inches thick)
- C—40 to 60 inches; light yellowish brown (10YR 6/4) very cobbly loam, dark yellowish brown (10YR 3/4) moist; massive; soft, very friable, sticky and plastic;

few fine interstitial pores; 15 percent pebbles, 30 percent cobbles and 10 percent stones; neutral (pH 7.2).

**Type location:** Lander County, Nevada, south part; about 19 miles north of Austin, approximately 1,300 feet west and 2,280 feet north of the southeast corner of sec. 15, T. 20 N., R. 46 E. (part of the BLM private contract completed in Lander County)

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from late July through early October

**Mean annual soil temperature:** 38 to 47 degrees F

**Mean summer soil temperature:** 55 to 59 degrees F

**Mollic epipedon thickness:** 16 to 60 inches

**Depth to bedrock:** 40 to more than 80 inches

**Control section:** Texture—predominantly loam but includes strata of fine sandy loam, sandy loam, silt loam, or clay loam; clay content—18 to 27 percent; rock fragments—35 to 50 percent, dominantly pebbles

**Profile reaction:** Slightly acid or neutral

**A horizon:**

Value—2, 3, 4, or 5 dry, 2 or 3 moist

Chroma—1, 2, or 3 in most pedons, chroma of 1 common only in A1 horizon, chroma of 3 common only in A3 horizon or below

Structure—platy, subangular blocky, angular; massive in some pedons

Base saturation—50 to 75 percent in upper part

**C horizon:**

Hue—10YR or 7.5YR

Value—4, 5, 6, or 7 dry, 3, 4, or 5 moist

Chroma—2 to 6

Features—horizon not present in some pedons where the mollic epipedon rests on the bedrock at depths of less than 48 inches

## Havingdon Series

The Havingdon series consists of moderately deep, well drained soils that formed in residuum derived from chert and shale with some influence from loess and volcanic ash. Havingdon soils are on side slopes of mountains and foothills. Slopes are 15 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic Xerollic Haplargids

**Typical pedon:** Havingdon gravelly silt loam, 20 to 50 percent slopes, in an area of the Humdun-

Havingdon-Bucan association. Pebbles cover 30 percent and stones 10 percent of the soil surface:

- A—0 to 3 inches; pale brown (10YR 6/3) gravelly silt loam, brown (10YR 4/3) moist; moderate very thin and thin platy structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine tubular pores; 20 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary. (1 to 4 inches thick)
- BA—3 to 8 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; many very fine, common fine and medium, and few coarse roots; many very fine tubular pores; 40 percent pebbles; mildly alkaline (pH 7.8); gradual wavy boundary. (3 to 7 inches thick)
- Bt1—8 to 14 inches; light yellowish brown (10YR 6/4) extremely gravelly clay, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; very hard, firm, sticky and plastic; common very fine, few fine and medium, and few coarse roots; many very fine tubular pores; common thick clay films on faces of peds and lining pores; 65 percent pebbles; moderately alkaline (pH 8.0); abrupt wavy boundary. (6 to 15 inches thick)
- Bt2—14 to 22 inches; pale brown (10YR 6/3) extremely gravelly clay, brown (10YR 5/3) moist; weak medium subangular blocky structure; very hard, firm, sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 80 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (0 to 4 inches thick)
- R—22 to 30 inches; fractured chert; medium soft lime masses along fractures.

**Type location:** Lander County, Nevada; about 11 miles east of Battle Mountain, approximately 2,300 feet south and 1,300 feet west of the northeast corner of sec. 1, T. 31 N., R. 46 E.

#### Range in Characteristics

- Soil moisture:* Usually dry, moist in some part from late October through early June
- Soil temperature:* 48 to 52 degrees F
- Depth to bedrock:* 20 to 26 inches
- Depth to base of the Bt horizon:* 20 to 26 inches
- Control section:* Clay content—35 to 45 percent; rock fragments—50 to 80 percent pebbles, dominantly angular chert and shale

#### A horizon:

Value—3 or 4 moist

Chroma—2 or 3

Structure—weak or moderate, very thin to medium platy; massive in some pedons

Consistence—soft or slightly hard dry

Reaction—neutral or mildly alkaline

#### BA horizon:

Value—5 or 6 dry, 4 or 5 moist

Texture—very gravelly sandy clay loam or very gravelly clay loam

Rock fragments—35 to 60 percent pebbles

Consistence—slightly hard or hard dry, very friable to firm moist, slightly sticky or sticky wet

Reaction—neutral to moderately alkaline

#### Bt horizon:

Value—5 or 6 dry or moist

Chroma—3 or 4

Texture—very gravelly clay, very gravelly sandy clay, or extremely gravelly clay

Rock fragments—50 to 80 percent angular chert and shale fragments, content increasing with depth

Structure—weak or moderate, fine or medium angular or subangular blocky; massive in some pedons

Consistence—hard or very hard dry, very friable to firm moist, sticky or very sticky and plastic or very plastic wet

Reaction—neutral to moderately alkaline

Secondary lime—soft masses of lime accumulation in bedrock fractures and in the lower 1 or 2 inches in some pedons having a thicker solum

#### R horizon:

Generally well fractured, some roots and thin to moderately thick clay films in the fractures to a depth of up to 12 inches in some pedons

### Hessing Series

The Hessing series consists of very deep, well drained soils that formed in loess and silty alluvium with some influence from volcanic ash over coarse alluvium derived from mixed sediments of mostly tuff, basalt, rhyolite, and andesite. Hessing soils are on fan skirts and inset fans. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Typic Camborthids

**Typical pedon:** Hessing silt loam, 0 to 2 percent slopes:

A—0 to 4 inches; light brownish gray (2.5Y 6/2) silt

loam, dark grayish brown (2.5Y 4/2) moist; moderate thin and thick platy structure; slightly hard, very friable, slightly sticky and plastic; few very fine, fine, and medium roots; many vesicular pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (3 to 7 inches thick)

**Bw**—4 to 11 inches; light gray (10YR 7/2) silty clay loam, brown (10YR 5/3) moist; moderate coarse prismatic structure; hard, friable, sticky and very plastic; many very fine and few fine roots; many very fine interstitial and tubular pores; moderately alkaline (pH 8.4); abrupt smooth boundary. (6 to 9 inches thick)

**Bqk**—11 to 13 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; weak thick platy structure; hard, very friable and firm, sticky and plastic; few very fine roots; common very fine tubular pores; 50 percent weak discontinuous silica cementation; 10 percent weak rounded 15- to 25-millimeter durinodes; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (0 to 3 inches thick)

**C**—13 to 18 inches; very pale brown (10YR 7/3) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine tubular pores; 5 percent fine pebbles; strongly alkaline (pH 9.0); abrupt wavy boundary. (4 to 8 inches thick)

**2Ck1**—18 to 26 inches; light gray (10YR 7/2) gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 25 percent pebbles; common fine lime filaments and lime coatings on pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (5 to 10 inches thick)

**2Ck2**—26 to 30 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 30 percent pebbles; few fine lime filaments; slightly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (4 to 14 inches thick)

**3Ck3**—30 to 60 inches; variegated extremely gravelly loamy coarse sand; single grained; loose, nonsticky and nonplastic; few very fine roots; 65 percent pebbles; many fine lime filaments; slightly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; approximately 61 miles southwest of Battle Mountain; about 790 feet east and 300 feet north of the southwest corner of sec. 7, T. 24 N., R. 41 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in some part for short periods from October through May

*Soil temperature:* 47 to 53 degrees F

*Depth to base of Bw horizon:* 11 to 16 inches

*Depth to unconformable 2Ck horizon:* 15 to 25 inches

*Depth to unconformable 3Ck horizon:* 25 to 36 inches

*Control section:* Clay content—8 to 18 percent when mixed; texture—averages gravelly loam or gravelly sandy loam; rock fragments—15 to 35 percent when mixed

*Other features:* As much as 50 percent thin, discontinuous, weak, silica-cemented lenses and as much as 20 percent weak durinodes in any horizon below a depth of 11 inches in some pedons

#### A horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—thin to thick platy; prismatic; massive in some pedons

Reaction—moderately alkaline or strongly alkaline

Other features—slightly effervescent surface due to calcareous dust recharge in some pedons

#### Bw horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—silt loam or silty clay loam

Structure—platy, prismatic, blocky; massive in some pedons

#### 2Ck horizon:

Texture—gravelly loam or gravelly sandy loam

Clay content—15 to 27 percent

Rock fragments—15 to 35 percent, mainly pebbles

Consistence—slightly plastic or plastic wet

#### 3Ck horizon:

Texture—stratified very gravelly loamy coarse sand to extremely gravelly sand

Rock fragments—50 to 70 percent, mainly pebbles

Consistence—soft or loose dry, nonplastic or slightly plastic wet

Reaction—mildly alkaline to strongly alkaline

### Hooplite Series

The Hooplite series consists of very shallow, well drained soils that formed in residuum derived from rhyolitic rocks. Hooplite soils are on side slopes of hills and mountains. Slopes range from 30 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Hooplite very gravelly fine sandy loam, 4 to 15 percent slopes, in an area of the Hooplite-Stingdorn association, in Lander County, south part:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; many fine and medium vesicular pores; 40 percent pebbles, 5 percent cobbles; slightly effervescent; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 4 inches thick)

A2—2 to 4 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, sticky and plastic; common very fine and fine roots; common very fine and fine interstitial and tubular pores; 20 percent pebbles, 5 percent cobbles; common strongly effervescent thin lime coatings on undersides of rock fragments; slightly effervescent matrix; mildly alkaline (pH 7.8); clear wavy boundary. (0 to 4 inches thick)

Bt—4 to 8 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine interstitial and tubular pores; 50 percent pebbles, 5 percent cobbles; common thin lime coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 8 inches thick)

R—8 inches; hard fractured rhyolitic tuff.

**Type location:** Lander County, Nevada, south part; approximately 25 miles northeast of Austin, about 1,100 feet south of the northwest corner of sec. 25, T. 22 N., R. 46 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Usually dry, moist during winter and early spring

**Soil temperature:** 47 to 52 degrees F

**Soil thickness and depth to hard bedrock:** 6 to 14 inches

**Control section:** Clay content—18 to 25 percent when mixed; rock fragments—35 to 50 percent pebbles, 0 to 10 percent cobbles

**Reaction throughout the profile:** Mildly alkaline or moderately alkaline

**Other features:** As much as 3 inches of highly fractured bedrock overlying the lithic contact in some pedons

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Carbonates—noneffervescent or slightly effervescent

Structure—platy or subangular blocky

#### Bt horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 to 4

Texture—very gravelly loam, very gravelly clay loam

Rock fragments—35 to 50 percent

Structure—subangular blocky or granular

Carbonates—slightly effervescent or strongly effervescent

### Hopeka Series

The Hopeka series consists of very shallow, well drained soils that formed in residuum and colluvium derived from limestone and dolostone. Hopeka soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, frigid Lithic Xeric Torriorthents

**Typical pedon:** Hopeka very gravelly loam, 30 to 50 percent slopes, in an area of the Kram-Hopeka-Rock outcrop association, in Lander County, south part. Pebbles cover 20 percent and cobbles 25 percent of the soil surface:

A—0 to 4 inches; light brownish gray (10YR 6/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine and few medium and coarse roots; many very fine and fine interstitial and common fine tubular pores; 50 percent pebbles; lime coatings on undersides of pebbles; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 4 inches thick)

C—4 to 8 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium and few coarse roots; common fine interstitial, common very fine and fine, and few medium tubular pores; 55 percent pebbles; lime coatings on undersides of pebbles; violently effervescent; moderately alkaline

(pH 8.4); abrupt smooth boundary. (3 to 8 inches thick)

R—8 inches; limestone.

**Type location:** Lander County, Nevada, south part; about 20 miles west of Austin, approximately 550 feet south and 1,050 feet west of the northeast corner of sec. 32, T. 21 N., R. 42 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 43 to 47 degrees

*Depth to bedrock:* 4 to 10 inches

*Control section:* Clay content—18 to 25 percent; rock fragments—35 to 60 percent limestone or dolostone pebbles, cobbles, or stones

*Carbonates:* Violently effervescent but surface layer strongly effervescent in some pedons; 40 to 85 percent calcium carbonate equivalent

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

#### A horizon:

Hue—10YR or 7.5YR

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

#### C horizon:

Hue—10YR or 7.5YR

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak to moderate subangular blocky; massive in some pedons

### Humboldt Series

The Humboldt series consists of very deep, poorly drained soils that formed mainly in silty alluvium derived from mixed rock sources and in volcanic ash. Humboldt soils are on flood plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Fine, montmorillonitic (calcareous), mesic Fluvaquent Haplaquolls

**Typical pedon:** Humboldt silty clay loam, slightly saline, 0 to 2 percent slopes:

A1—0 to 2 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; strong medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, friable, sticky and plastic; many very fine and fine random and common medium oblique and horizontal roots; common very fine interstitial and tubular pores; less than ¼-inch-thick light gray (10YR 6/1) and dark

gray (10YR 4/1 moist) depositional surface crust; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 12 inches thick)

A2—2 to 7 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; common fine distinct strong brown (7.5YR 5/6) mottles; strong medium and coarse prismatic structure parting to strong very fine, fine, and medium angular blocky; hard, firm, sticky and very plastic; many very fine random, few fine vertical, and few medium horizontal and oblique roots; few very fine tubular and common very fine interstitial pores; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 9 inches thick)

A3—7 to 11 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; common fine distinct strong brown (7.5YR 5/6) mottles; moderate coarse prismatic structure parting to strong fine and medium subangular blocky; hard, firm, sticky and very plastic; common very fine interstitial and tubular pores; violently effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (0 to 10 inches thick)

C1—11 to 16 inches; gray (10YR 6/1) silty clay, very dark gray (10YR 3/1) moist; moderate coarse and very coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm, sticky and very plastic; common very fine random and few fine and medium vertical and oblique roots; few very fine interstitial and many very fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (4 to 17 inches thick)

C2—16 to 34 inches; light gray (10YR 6/1) silty clay loam, dark gray (10YR 4/1) moist; few fine distinct brown (7.5YR 5/4) mottles, dark brown (7.5YR 4/4) moist; massive; hard, firm, sticky and very plastic; few very fine and fine random and few medium vertical and oblique roots; many very fine vesicular and tubular pores; violently effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (5 to 18 inches thick)

Ck1—34 to 51 inches; light gray (10YR 7/1) silty clay loam, grayish brown (10YR 5/2) moist; common fine distinct brown (7.5YR 4/4) mottles, yellowish red (5YR 4/6) moist; massive; hard, friable, sticky and plastic; few very fine and fine random and few medium oblique roots; common very fine vesicular and many very fine tubular pores; common thin clay films lining pores; about 1 percent medium irregular lime concretions; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 20 inches thick)

Ck2—51 to 61 inches; light gray (10YR 6/1) silty clay, dark gray (10YR 4/1) moist; common fine distinct

light yellowish brown (2.5Y 6/4 moist) mottles; massive; hard, friable, sticky and very plastic; very few very fine random roots; many very fine vesicular and tubular pores; many thin clay films lining pores; 5 percent fine and medium irregular lime concretions; common fine distinct white (10YR 8/1) lime mottles, light gray (10YR 6/1) moist; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 30 inches thick)

Ck3—61 to 67 inches; light gray (10YR 6/1) silty clay, grayish brown (10YR 5/2) moist; many fine distinct weak red (2.5YR 4/2) and dark reddish brown (2.5YR 3/4) mottles, dark reddish brown (2.5YR 3/4) and reddish brown (2.5YR 4/4) moist; massive; hard, friable, sticky and very plastic; many very fine vesicular and tubular pores; many thin clay films lining pores; 10 percent fine and medium irregular lime concretions; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 1.3 miles northeast of Battle Mountain, approximately 530 feet south and 1,320 feet east of the northwest corner of sec. 16, T. 32 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually saturated for 1 month or more during most years unless drained

**Soil temperature:** 50 to 54 degrees F

**Mollic epipedon thickness:** 10 to 24 inches

**Control section:** Clay content—35 to 45 percent; texture—silty clay loam to clay with minor substrata of silt loam in some pedons

**Reaction throughout the profile:** Mildly alkaline to very strongly alkaline, the higher values only in sodium-affected areas

**Effervescence:** Slightly effervescent to strongly effervescent throughout; some noneffervescent strata below 20 inches in some pedons

**Carbonates:** Calcium carbonate equivalent is less than 15 percent

**Iron mottles:** Distinct or prominent iron mottles in the lower part of the mollic epipedon or immediately below; if no mottles, matrix chroma is 1 or 0

**Other features:** Stratified very fine sandy loam to fine sand below a depth of 30 inches in some pedons

#### A horizon:

Hue—10YR or 2.5Y

Value—4 or 5 dry, 6 on surface of some pedons because of desposition, 2 or 3 moist

Chroma—1 or 2

Structure—moderate or strong, fine to coarse blocky, platy, prismatic, or granular or weak fine

to coarse subangular blocky in the Ap horizon (where present)

Consistence—slightly hard or hard

Organic matter content—2 to 4 percent

Other features—buried A horizons are common

#### C horizon:

Hue—10YR to 5GY, or N

Value—6 or 7 dry, 3 to 5 moist; volcanic ash layers are 8 dry, 6 moist

Chroma—0 to 3

Structure—moderate or strong prismatic or blocky in the upper part; weak in the lower part; massive in the lower part in some pedons

Carbonates—few to many very fine to medium lime concretions or soft segregations in some subhorizons

### Humdun Series

The Humdun series consist of very deep, well drained soils formed in some loess and a lesser amount of volcanic ash over loamy alluvium and residuum of mostly extrusive volcanic rocks. Humdun soils are on side slopes of foothills. Slopes are 15 to 50 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, frigid Durixerollic Camborthids

**Typical pedon:** Humdun silt loam, gravelly substratum, 15 to 50 percent slopes, in an area of the Bojo-Humdun-Boulflat association:

A1—0 to 3 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary. (2 to 8 inches thick)

A2—3 to 6 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; 3 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (0 to 6 inches thick)

Bw1—6 to 12 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.0); gradual wavy boundary. (6 to 11 inches thick)

**Bw2**—12 to 24 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine tubular pores; common weakly cemented durinodes; moderately alkaline (pH 8.4); gradual wavy boundary. (5 to 12 inches thick)

**Bqk1**—24 to 30 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine tubular pores; many strongly cemented coarse durinodes; few lime coatings on undersides of pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 13 inches thick)

**Bqk2**—30 to 41 inches; very pale brown (10YR 7/4) loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; many weakly cemented durinodes; common soft lime masses; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (0 to 15 inches thick)

**2Bk**—41 to 60 inches; light gray (10YR 7/2) very gravelly loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and plastic; few very fine roots; many very fine tubular pores; 45 percent pebbles; common weakly cemented durinodes; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada; about 9 miles southeast of Battle Mountain, approximately 1,500 feet south and 1,500 feet east of the northwest corner of sec. 35, T. 32 N., R. 46 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in some part from late October through early June

**Soil temperature:** 45 to 47 degrees F

**Combined thickness of A and Bw horizons and depth to Bqk horizon:** 24 to 33 inches

**Control section:** Clay content—10 to 15 percent; texture—loam, very fine sandy loam, or silt loam; rock fragments—less than 5 percent when mixed

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak or moderate, fine or medium granular or subangular blocky or thin or medium platy

Consistence—soft or slightly hard dry

Reaction—neutral or mildly alkaline

Other features—pedons that have a dark colored A

horizon do not meet the thickness requirement for a mollic epipedon

#### Bw horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—fine to coarse subangular blocky or prismatic; massive in some pedons

Reaction—neutral to moderately alkaline

Other features—up to 20 percent durinodes in the lower part of the Bw horizon in some pedons

#### Bqk horizons:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

Consistence—soft, slightly hard, or hard dry

Reaction—moderately alkaline or strongly alkaline

Cementation—20 to 80 percent durinodes that are hard to extremely hard dry and firm or very firm moist

Other features—white lime segregations in most pedons; very gravelly loam 2Bqk horizon at a depth of 40 to 60 inches in some pedons

### Isolde Series

The Isolde series consists of very deep, excessively drained soils that formed in eolian sand from mixed rock sources. Isolde soils are on stabilized dunes over lake beds, playas, terraces, alluvial fans, and hills. Slopes are 0 to 30 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Isolde fine sand, 4 to 30 percent slopes, in an area of the Bubus-Isolde association:

**A**—0 to 7 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 20 inches thick)

**C1**—7 to 26 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; moderately alkaline (pH 8.4); diffuse smooth boundary. (0 to 40 inches thick)

**C2**—26 to 60 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.4).



**Type location:** Lander County, Nevada; approximately 20 miles southwest of Battle Mountain, about 2,100 feet west and 1,300 feet south of the northeast corner of sec. 4, T. 29 N., R. 42 E.

#### Range in Characteristics

*Soil moisture:* Usually dry from April through mid-November, moist for short periods from mid-November through March

*Soil temperature:* 53 to 57 degrees F

*Control section:* Texture—commonly fine sand; sand with 50 to 80 percent passing the number 40 sieve and 1 to 10 percent passing the number 200 sieve in some pedons

*Reaction throughout the profile:* Neutral to moderately alkaline

#### A horizon:

Hue—10YR or 2.5Y

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 or 3

#### C horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Other features—2C horizon below a depth of 40 inches in some pedons; moderately to strongly alkaline and noneffervescent to strongly effervescent in the lower part of the C horizon in some pedons

### Itca Series

The Itca series consists of shallow, well drained soils that formed in residuum derived from extrusive volcanic and pyroclastic rocks. Itca soils are on side slopes of mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Itca extremely stony loam, 50 to 75 percent slopes, in an area of the Itca-Ninemile-Rock outcrop association, in Lander County, south part. Pebbles cover 20 percent, cobbles 35 percent, and stones 25 percent of the soil surface:

A1—0 to 6 inches; grayish brown (10YR 5/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure parting to weak very fine granular; slightly hard, very friable, nonsticky and slightly plastic; many very fine and few fine roots; many fine interstitial pores; 30

percent pebbles, 15 percent cobbles, 15 percent stones; neutral (pH 7.2); clear wavy boundary. (1 to 7 inches thick)

A2—6 to 9 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and medium roots; common fine interstitial pores; 20 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (0 to 6 inches thick)

Bt1—9 to 13 inches; pale brown (10YR 6/3) very gravelly clay loam, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, very sticky and very plastic; common fine and few medium and coarse roots; common fine interstitial pores; many thin clay films in pores and on peds; 25 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.4); clear irregular boundary. (3 to 8 inches thick)

Bt2—13 to 17 inches; light yellowish brown (10YR 6/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; hard, firm, very sticky and very plastic; few fine, medium, and coarse roots; few fine tubular pores; common moderately thick clay films in pores and on peds; 20 percent pebbles, 20 percent cobbles, 10 percent stones; mildly alkaline (pH 7.4); abrupt broken boundary. (3 to 10 inches thick)

R—17 inches; fractured andesite.

**Type location:** Lander County, Nevada, south part; approximately 22 miles east of Austin, about 1,950 feet east and 320 feet south of the northwest corner of sec. 21, T. 19 S., R. 40 E. (part of the BLM private contract in Lander County)

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry 60 to 90 consecutive days from July through October

*Soil temperature:* 43 to 47 degrees F

*Mollic epipedon thickness:* 7 to 15 inches, may include the upper Bt horizon

*Depth to bedrock:* 10 to 20 inches

#### A horizon:

Hue—10YR or 7.5YR

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—weak or moderate, medium to thick platy or medium to coarse subangular blocky

Consistence—soft or slightly hard dry, very friable or friable moist, nonsticky to slightly sticky and slightly plastic to plastic wet

Reaction—neutral or mildly alkaline

**Bt horizon:**

Hue—7.5YR or 10YR

Value—4, 5, or 6 dry and 3 or 4 moist

Chroma—2, 3, or 4

Texture—clay or clay loam

Clay content—35 to 45 percent

Rock fragments—35 to 60 percent when averaged, mainly pebbles and cobbles; up to 85 percent in some subhorizons of some pedons

Consistence—slightly hard or hard dry, friable or firm moist, and sticky or very sticky wet

Reaction—neutral to moderately alkaline

Other features—horizon tongues into the bedrock fractures in shallower pedons

**BC or C horizon (where present):**

A thin horizon composed mainly of very soft decomposing rock

**Izod Series**

The Izod series consists of shallow, somewhat excessively drained soils that formed in residuum and colluvium derived from limestone. Izod soils are on crests and side slopes of hills and mountains and rock core areas of fan piedmont remnants. Slopes are 15 to 75 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents

**Typical pedon:** Izod extremely cobbly fine sandy loam, 15 to 50 percent slopes, in an area of the Izod-Rock outcrop association. Pebbles cover 30 percent, cobbles 25 percent, and stones 5 percent of the soil surface:

A—0 to 4 inches; pale brown (10YR 6/3) extremely cobbly loam, dark brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; many very fine vesicular pores; 35 percent pebbles, 35 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 4 inches thick)

C—4 to 10 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine roots; common very fine interstitial pores; 30 percent pebbles, 10 percent cobbles, 5 percent stones; few fine soft lime masses; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (3 to 12 inches thick)

2R—10 inches; limestone; weathered and fractured in the upper 1 inch; few fine roots in fractures; common lime pendants on rock fragments; hard at a depth of 11 inches.

**Type location:** Lander County, Nevada; about 52 miles southwest of Battle Mountain, approximately 1,800 feet north and 800 feet east of the southwest corner of sec. 5, T. 24 N., R. 40 E.

**Range in Characteristics**

**Soil moisture:** Usually dry, moist late fall to early spring

**Soil temperature:** 47 to 50 degrees F

**Depth to bedrock:** 7 to 14 inches

**Control section:** Clay content—18 to 25 percent; rock fragments—40 to 75 percent, mainly pebbles

**Reaction throughout the profile:** Mildly alkaline or moderately alkaline

**Calcium carbonate equivalent:** 50 to 60 percent

**Other features:** Silica and lime laminae covering up to 75 percent of the bedrock surface area

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—weak or moderate, very thin or thin platy

Effervescence—strong or violent

**C horizon:**

Value—6 to 8 dry, 4 or 5 moist

Chroma—2 or 3

Structure—weak or moderate subangular blocky; massive in some pedons

**Jenor Series**

The Jenor series consists of moderately deep, well drained soils that formed mainly in alluvium derived from mixed rock sources and in loess. Jenor soils are on fan piedmont remnants. Slopes are 0 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Typic Durorthids

**Typical pedon:** Jenor very fine sandy loam, 0 to 2 percent slopes, in an area of the Jenor-Blacka very fine sandy loams:

A—0 to 6 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 4/3) moist; moderate thin to thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; many very fine vesicular pores; very slightly effervescent in spots; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 8 inches thick)

- Bw**—6 to 16 inches; light gray (10YR 7/2) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and slightly plastic; common fine and few medium oblique roots; many very fine interstitial and tubular pores; strongly alkaline (pH 8.6); clear wavy boundary. (4 to 10 inches thick)
- Bk**—16 to 22 inches; very pale brown (10YR 7/3) sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and slightly plastic; few fine and medium oblique and horizontal roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (0 to 6 inches thick)
- Bqk**—22 to 26 inches; very pale brown (10YR 8/3) loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, friable, nonsticky and slightly plastic; very few fine and medium roots; common very fine tubular pores; about 20 percent 2- to 10-millimeter, weak durinodes; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (4 to 16 inches thick)
- Bqkm1**—26 to 43 inches; white (10YR 8/2) indurated silica-cemented duripan, very pale brown (10YR 7/3) moist; common fine distinct dark yellowish brown (10YR 4/4 moist) mottles; strong medium and very thick platy structure; very hard, extremely firm; very few fine horizontal roots; few very fine tubular pores; peds have continuous, 1/16- to 1/4-inch-thick very pale brown (10YR 8/3) silica laminae; violently effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (6 to 20 inches thick)
- Bqkm2**—43 to 56 inches; white (10YR 8/2) indurated silica-cemented duripan, very pale brown (10YR 7/3) moist; few fine distinct light yellowish brown (10YR 6/4 moist) and dark yellowish brown (10YR 4/4 moist) mottles; strong thick platy structure; very hard, extremely firm; common very fine tubular pores; plate surfaces have as much as 1/16-inch-thick silica laminae; violently effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (0 to 13 inches thick)
- Bqkm3**—56 to 60 inches; white (10YR 8/2) indurated silica-cemented duripan, very pale brown (10YR 7/4) moist; strong very thick platy structure; very hard, extremely firm; common very fine tubular pores; plate surfaces have as much as 1/16-inch-thick very pale brown (10YR 7/3) and pale brown (10YR 6/3 moist) silica laminae; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; approximately 12 miles north of Battle Mountain, about 1,050 feet north and 1,050 feet east of the southwest corner of sec. 7, T. 34 N., R. 45 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in part for short periods from late October through May

*Soil temperature:* 47 to 51 degrees F

*Depth to indurated duripan:* 20 to 30 inches

*Control section:* Texture—fine sandy loam, sandy loam, or loam; clay content—8 to 18 percent; rock fragments—up to 15 percent, mainly pebbles

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

#### *A horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Consistence—soft or slightly hard dry, friable or very friable moist

#### *Bw horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

Texture—fine sandy loam or loam

Structure—weak or moderate, medium or coarse subangular blocky; massive in some pedons

#### *Bqk horizon:*

Value—7 or 8 dry, 4 to 6 moist

Chroma—3 to 6

Texture—fine sandy loam, loam, or sandy loam

Rock fragments—up to 15 percent, mainly pebbles

Effervescence—strong or violent

Other features—up to 10 percent pan fragments near the Bqk horizon boundary in some pedons

## Jung Series

The Jung series consists of shallow, well drained soils that formed in residuum derived from metavolcanic and volcanic rocks. Jung soils are on crests and side slopes of mountains and hills. Slopes are 8 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic Lithic Xerollic Haplargids

**Typical pedon:** Jung very cobbly loam, 15 to 30 percent slopes, in an area of the Jung-Newpass association, in Lander County, south part. Pebbles cover 20 percent and cobbles 25 percent of the surface:

**A1**—0 to 3 inches; light brownish gray (10YR 6/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure parting to weak very fine granular; soft, very friable, slightly sticky and slightly plastic; few fine roots; many fine vesicular pores; 25

percent pebbles, 25 percent cobbles; neutral (pH 7.0); clear smooth boundary. (1 to 3 inches thick)

A2—3 to 8 inches; light brownish gray (10YR 6/2) cobbly loam, dark brown (10YR 3/3) moist; weak thin platy structure parting to weak very fine granular; soft, very friable, slightly sticky and slightly plastic; common fine roots; many very fine interstitial pores; 10 percent pebbles, 20 percent cobbles; neutral (pH 7.2); clear wavy boundary. (2 to 6 inches thick)

Bt—8 to 15 inches; brown (10YR 5/3) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate medium and fine subangular blocky; very hard, firm, sticky and plastic; common fine roots; few very fine tubular pores; continuous thick clay films on peds; 20 percent pebbles, 20 percent cobbles; moderately alkaline (pH 8.4); gradual wavy boundary. (5 to 8 inches thick)

Btk—15 to 19 inches; pale brown (10YR 6/3) very cobbly clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few fine roots; few very fine tubular pores; thin patchy clay films on peds; 30 percent pebbles, 20 percent cobbles; lime coatings on undersides of rock fragments; slightly effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (3 to 5 inches thick)

R—19 inches; fractured hard rhyolite; fractures more than 4 inches apart.

**Type location:** Lander County, Nevada, south part; in cut at side of power line access road, approximately 17.5 miles west of Austin near Mount Airy, about 50 feet south and 1,300 feet west of the northeast corner of sec. 5, T. 19 N., R. 41 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to bedrock:** 14 to 20 inches

**Control section:** Clay content—35 to 45 percent; rock fragments—35 to 50 percent, mainly pebbles and cobbles

#### A horizon:

Value—3 or 4 moist

Chroma—2 or 3

Structure—weak or moderate, thin to medium platy

Reaction—neutral or mildly alkaline

#### Bt horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—very gravelly clay loam, very cobbly clay loam, very cobbly clay

Structure—weak to strong, prismatic or angular blocky structure; subangular blocky in the lower subhorizon of some pedons

Reaction—moderately alkaline or strongly alkaline

#### Btk horizon:

Carbonates—slightly effervescent or strongly effervescent

### Kelk Series

The Kelk series consists of very deep, well drained soils that formed in some loess that contains volcanic ash but mostly in mixed silty alluvium derived mainly from mixed rock sources. Kelk soils are on inset fans and inset fan remnants. Slopes are 0 to 4 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is 48 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Kelk silt loam, saline, 0 to 4 percent slopes:

A—0 to 3 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (2 to 4 inches thick)

Bw1—3 to 12 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate very fine and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 4 inches thick)

Bw2—12 to 18 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 15 inches thick)

Bqk1—18 to 29 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; few large distinct light brownish gray (2.5Y 6/2 dry) and few fine prominent yellowish brown (10YR 5/8 moist) relict mottles; massive; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; 40 percent 5- to 15-millimeter, moderately cemented durinodes; few fine lime filaments; slightly effervescent; moderately alkaline (pH 8.4); gradual irregular boundary. (0 to 15 inches thick)

**Bqk2**—29 to 42 inches; very pale brown (10YR 7/4) silt loam, yellowish brown (10YR 5/4) moist; few large distinct light brownish gray (2.5Y 6/2 dry) and few fine prominent yellowish brown (10YR 5/8 moist) relict mottles; massive; hard, firm, sticky and plastic; few very fine and fine roots; few very fine tubular pores; few fine lime filaments; weak continuous silica cementation; strongly effervescent; moderately alkaline (pH 8.2); gradual irregular boundary. (13 to 34 inches thick)

**Bqk3**—42 to 60 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; few large distinct light brownish gray (2.5Y 6/2 dry) and few fine prominent yellowish brown (10YR 5/8 moist) relict mottles; massive; soft, friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 20 percent 5- to 15-millimeter, weakly cemented durinodes; common fine lime filaments; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; about 33 miles south of Battle Mountain, approximately 1,500 feet east and 1,500 feet south of the northwest corner of sec. 5, T. 26 N., R. 43 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to base of Bw horizon:** 12 to 18 inches

**Depth to weak continuous silica cementation:** 13 to 35 inches

**Depth to carbonates:** 12 to 35 inches

**Control section:** Clay content—18 to 27 percent

**Other features:** Normally slightly or moderately salt affected below a depth of 24 to 48 inches

#### A horizon:

Hue—10YR or 2.5Y

Value—5 or 6 dry

Chroma—2 or 3

Structure—very thin or thin platy or very fine or fine prismatic; massive in some pedons

Consistence—slightly sticky or sticky and slightly plastic or plastic

Reaction—neutral to moderately alkaline

Effervescence—noneffervescent or slightly effervescent

#### Bw horizon:

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—blocky or prismatic; massive in some pedons

Reaction—neutral to moderately alkaline; strongly alkaline where salt and sodium affected

Effervescence—noneffervescent or slightly effervescent

Other features—10 to 20 percent weak durinodes near the lower boundary in some pedons

#### *Bq (where present) and Bqk horizons:*

Value—6 to 8 dry, and 3 to 6 moist

Chroma—2, 3, or 4

Texture—dominantly silt loam, thin strata of silty clay loam below a depth of 30 inches in some pedons

Reaction—neutral to strongly alkaline, becoming more alkaline with depth

Effervescence—slightly effervescent to violently effervescent in the Bqk horizon

Cementation—subhorizons not continuously silica cemented contain 30 to 90 percent durinodes or are 20 to 50 percent discontinuous weakly silica cemented

Other features—No relict mottles in the lower part of the Bqk horizon in some pedons; lenses of 5 to 15 percent pebbles in some Bqk subhorizons or an extremely gravelly substratum below a depth of 42 inches in some pedons

### ***Kingingham Series***

The Kingingham series consists of moderately deep, well drained soils that formed in a thin loess mantle over alluvium derived from mixed rock sources.

Kingingham soils are on fan piedmonts. Slopes are 2 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Typic Nadurargids

**Typical pedon:** Kingingham gravelly very fine sandy loam, 2 to 8 percent slopes, in an area of the Kingingham-Golconda-Whirlo association. Pebbles cover 20 percent of the surface:

**A1**—0 to 3 inches; very pale brown (10YR 7/3) gravelly very fine sandy loam, dark brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, nonsticky and nonplastic; few fine and medium roots; many very fine and fine vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 5 inches thick)

**A2**—3 to 7 inches; pale brown (10YR 6/3) gravelly very fine sandy loam, dark brown (10YR 4/3) moist; strong thick platy structure; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; many very fine and fine vesicular pores; 20 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (3 to 5 inches thick)

2Bt<sub>nk1</sub>—7 to 12 inches; light yellowish brown (10YR 6/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; strong medium angular blocky structure; slightly hard, very friable, very sticky and very plastic; common fine and medium roots; many very fine and fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 15 percent pebbles; common fine lime in seams; slightly effervescent matrix; strongly alkaline (pH 8.6); clear wavy boundary. (3 to 6 inches thick)

2Bt<sub>nk2</sub>—12 to 18 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; hard, firm, very sticky and very plastic; common fine and medium roots; common very fine tubular pores; many moderately thick and thick clay films on faces of peds and lining pores; 20 percent pebbles; common fine lime in seams; slightly effervescent matrix; strongly alkaline (pH 8.8); clear wavy boundary. (5 to 9 inches thick)

2Bt<sub>nqk</sub>—18 to 22 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; hard, firm, very sticky and very plastic; few fine roots; few very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 10 percent weakly cemented durinodes; 50 percent pebbles; common fine lime in seams; strongly effervescent; strongly alkaline (pH 8.6); abrupt irregular boundary. (3 to 8 inches thick)

2Bq<sub>km1</sub>—22 to 28 inches; very pale brown (10YR 8/3) indurated duripan, very pale brown (10YR 7/4) moist; massive; extremely hard, extremely firm; violently effervescent; clear smooth boundary. (4 to 19 inches thick)

2Bq<sub>km2</sub>—28 to 60 inches; very pale brown (10YR 8/3) indurated duripan with weakly to strongly cemented, thin, horizontal alternating lenses; very pale brown (10YR 7/4) moist; massive; violently effervescent.

**Type location:** Lander County, Nevada; about 20 miles south of Battle Mountain, about 2,630 feet south and 2,630 feet east of the northwest corner of sec. 6, T. 30 N., R. 43 E.

#### Range in Characteristics

**Soil moisture:** Moist for short periods in winter and early spring, dry from late May through October

**Soil temperature:** 47 to 52 degrees F

**Depth to duripan:** 20 to 30 inches

**Reaction throughout the profile:** Moderately alkaline to strongly alkaline, becoming more alkaline with depth

**Other features:** A Bq<sub>k</sub> horizon is above the indurated duripan in some pedons

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

#### Bt horizon:

Value—4, 5, or 6 dry, 4 or 5 moist

Chroma—4 to 6

Texture—gravelly clay loam, gravelly silty clay loam, gravelly clay, or gravelly silty clay

Clay content—35 to 50 percent

Rock fragments—15 to 35 percent when mixed, predominantly pebbles

Exchangeable sodium—15 to 30 percent

### Kodra Series

The Kodra series consists of moderately deep, well drained soils that formed mainly in alluvium derived from mixed rock sources and in loess and volcanic ash. Kodra soils are on fan piedmont remnants. Slopes are 8 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Haploxerollic Durorthids

**Typical pedon:** Kodra silt loam, 8 to 15 percent slopes, in an area of the Orovada-Kodra-Puett association:

A—0 to 4 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 6 inches thick)

Bw—4 to 14 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine, common medium, and few coarse roots; many fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 11 inches thick)

Bq<sub>k1</sub>—14 to 19 inches; very pale brown (10YR 8/3) loam, light yellowish brown (10YR 6/4) moist; moderate fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; many fine and few medium roots; few fine tubular pores; 10 percent pebbles; 25 percent 5- to 10-millimeter, weakly cemented durinodes; slightly effervescent; few fine irregular lime concretions; lime coatings on pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 5 inches thick)

Bq<sub>k2</sub>—19 to 30 inches; very pale brown (10YR 7/3) sandy loam, yellowish brown (10YR 5/4) moist;

massive; hard, firm, nonsticky and nonplastic; few fine and medium roots; few fine tubular pores; 10 percent pebbles; weak continuous silica cementation; strongly effervescent; strongly alkaline (pH 9.4); abrupt smooth boundary. (9 to 12 inches thick)

**Bqkm**—30 to 51 inches; very pale brown (10YR 7/3) strongly cemented duripan, pale brown (10YR 6/8) moist.

**Type location:** Lander County, Nevada; about 22 miles northeast of Battle Mountain, approximately 400 feet north and 1,400 feet west of the southeast corner of sec. 35, T. 36 N., R. 47 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 51 degrees F

*Depth to Bqk horizon:* 10 to 16 inches

*Depth to duripan:* 20 to 30 inches

*Calcium carbonate equivalent:* Less than 15 percent in the Bqk horizon

*Control section:* Clay content—12 to 18 percent

Rock fragments—0 to 15 percent

#### A horizon:

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 or 3

Other features—some pedons have an Ap horizon

#### Bw horizon:

Value—6 or 7 dry, 3 to 5 moist

Chroma—2 or 3 dry, 3 or 4 moist

Rock fragments—0 to 15 percent

Reaction—moderately alkaline or strongly alkaline

Texture—loam or sandy loam

Structure—subangular blocky or prismatic; massive in some pedons

#### Bqk horizon:

Value—6, 7, or 8 dry, 4 to 6 moist

Consistence—slightly hard to very hard

Reaction—moderately alkaline or strongly alkaline

Effervescence—slightly effervescent to strongly effervescent

Other features—durinodes or continuously weak silica cementation

#### Bqkm horizon:

Value—6 or 7 dry

Chroma—3 or 4

Reaction—moderately alkaline or strongly alkaline

Other features—some pedons contain iron mottles

#### 2Cq horizon (where present):

Value—6 or 7 dry

Chroma—3 or 4

Texture—most pedons are stratified silt loam to sand below the duripan

Rock fragments—0 to 15 percent

Reaction—moderately alkaline or strongly alkaline

Effervescence—slightly effervescent or strongly effervescent

### Koynik Series

The Koynik series consists of shallow, well drained soils that formed in residuum and colluvium derived from limestone and calcareous shales. Koynik soils are on crests and side slopes of hills and mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Torriorthents

**Typical pedon:** Koynik very gravelly very fine sandy loam, 15 to 30 percent slopes, in an area of the Koynik, steep-Koynik-Rock outcrop association. Pebbles cover 40 percent and cobbles 10 percent of the surface:

**A1**—0 to 3 inches; very pale brown (10YR 7/3) very gravelly very fine sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; many very fine vesicular pores; 25 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 5 inches thick)

**A2**—3 to 6 inches; pale brown (10YR 6/3) very gravelly silt loam, brown (10YR 4/3) moist; moderate thin platy structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; many very fine vesicular and few very fine tubular pores; 40 percent pebbles; common medium lime pendants on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 6 inches thick)

**Bk**—6 to 8 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; moderate thin platy structure parting to moderate fine granular; slightly hard, very friable, sticky and plastic; common very fine and fine roots; many very fine and fine interstitial and tubular pores; 40 percent pebbles; common fine soft masses of lime; common medium lime pendants on undersides of and coatings on remainder of rock fragments; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (2 to 5 inches thick)

**2R**—8 inches; hard limestone bedrock.

**Type location:** Lander County, Nevada; about 30 miles

southwest of Battle Mountain in the Fish Creek Mountains; in an unsectionized area about 1,000 feet north and 3,000 feet west of the southwest corner of sec. 6, T. 28 N., R. 43 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist for short periods in winter and early spring

*Soil temperature:* 47 to 52 degrees F

*Depth to lithic contact:* 8 to 14 inches

*Control section:* Clay content—15 to 25 percent; texture—very gravelly silt loam, very gravelly loam, or very gravelly very fine sandy loam; rock fragments—35 to 50 percent, predominantly pebbles

*Carbonates:* 40 to 60 percent calcium equivalent generally increasing with depth

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

*Other features:* Thin Cr horizon or 1 or 2 inches of highly fractured bedrock at the lithic contact in some pedons

#### A horizon:

Value—6 or 7 dry, 4, 5, or 6 moist

Chroma—2 to 4

#### Bk horizon:

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4, 5, or 6 moist

Chroma—3 or 4

Structure—weak or moderate platy or subangular blocky; massive in some pedons

## Koynik Variant

The Koynik Variant consists of shallow, well drained soils that formed in residuum and colluvium derived from basalt with an admixture of loess and volcanic ash. The Koynik Variant soils are on side slopes of volcanic cones. Slopes are 15 to 50 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents

**Typical pedon:** Koynik Variant very gravelly sandy loam, 15 to 50 percent slopes, rubbly, in an area of the Koynik Variant-Oxcurel-Whirlo association. Pebbles cover 50 percent, cobbles 20 percent, and stones 15 percent of the soil surface:

A—0 to 5 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine

vesicular pores; 25 percent pebbles, 15 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 6 inches thick)

C—5 to 10 inches; light brownish gray (10YR 6/2) very gravelly fine sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular and vesicular pores; 30 percent pebbles, 10 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (4 to 8 inches thick)

Cqk—10 to 13 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular pores; 30 percent pebbles, 10 percent cobbles; 40 to 60 percent weak and strong, 6- to 25-millimeter durinodes; pebbles and moderately thick lime and silica coatings and pendants on rock fragments; slightly effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary. (0 to 4 inches thick)

2R—13 inches; hard basalt bedrock.

**Type location:** Lander County, Nevada; approximately 25 miles southwest of Battle Mountain, about 1,600 feet west and 800 feet south of the northeast corner of sec. 29, T. 29 N., R. 42 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist for short periods in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Depth to bedrock:* 10 to 14 inches

*Control section:* Rock fragments—35 to 50 percent, mainly pebbles; texture—very gravelly fine sandy loam or very gravelly sandy loam

*Calcium carbonate equivalent:* Less than 15 percent

#### A horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 or 3

#### C horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

## Kram Series

The Kram series consists of very shallow, somewhat excessively drained soils formed in residuum derived from limestone. Kram soils are on side slopes of mountains. Slopes are 15 to 50 percent. Mean annual



precipitation is about 10 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents

**Typical pedon:** Kram very cobbly loam, 15 to 30 percent slopes, in an area of the Attella-Xine-Kram association. Pebbles cover 25 percent, cobbles 15 percent, and stones 2 percent of the soil surface:

A—0 to 4 inches; light brownish gray (10YR 6/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; 30 percent pebbles, 20 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 5 inches thick)

C—4 to 13 inches; pale brown (10YR 6/3) very gravelly very fine sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure: slightly hard, very friable, nonsticky and nonplastic; common very fine and fine and few coarse roots; common very fine interstitial pores; 45 percent pebbles, 10 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary. (3 to 10 inches thick)

R—13 inches; fractured limestone.

**Type location:** Lander County, Nevada; about 46 miles north of Austin, approximately 2,400 feet south and 1,100 feet west of the northeast corner sec. 19, T. 25 N., R. 40 E.

#### Range in Characteristics

**Soil moisture:** Usually dry from mid-June through October

**Soil temperature:** 49 to 52 degrees F

**Depth to bedrock:** 8 to 14 inches

**Control section:** Clay content—8 to 18 percent; rock fragments—40 to 50 percent pebbles; 5 to 10 percent cobbles and stones when averaged

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline. Calcium carbonate equivalent of whole soil (less than 20 millimeters) is 40 to 50 percent

#### A horizon:

Value—4, 5, or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—granular or platy

Effervescence—slightly to violently effervescent

#### C horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 3 or 4 moist

Chroma—2, 3, or 4

Texture—very gravelly very fine sandy loam or very gravelly loam

Rock fragments—45 to 55 percent pebbles, 5 to 10 percent cobbles and stones

Structure—subangular blocky; massive in some pedons

Effervescence—strongly or violently effervescent

### Kram Variant

The Kram Variant consists of shallow, well drained soils formed in residuum derived from extrusive volcanic rocks. Kram Variant soils are on crests and side slopes of hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Xeric Torriorthents

**Typical pedon:** Kram Variant very gravelly loam, 15 to 50 percent slopes, in an area of the Old Camp-Kram Variant-Rock outcrop association. Pebbles cover 70 percent, cobbles 5 percent, and stones 2 percent of the soil surface:

A—0 to 3 inches; light brownish gray (2.5Y 6/2) very gravelly loam, dark grayish brown (2.5Y 4/2) moist; strong thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine vesicular and tubular pores; 50 percent pebbles, 5 percent cobbles; slightly effervescent; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 5 inches thick)

Ck—3 to 11 inches; pale brown (10YR 6/3) extremely gravelly loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure: soft, very friable, sticky and plastic; common very fine and fine and few medium roots; common very fine and fine tubular pores; 70 percent pebbles, 5 percent cobbles; few thin lime coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 15 inches thick)

R—11 inches; hard fractured tuff bedrock.

**Type location:** Lander County, Nevada; approximately 21 miles south of Battle Mountain, about 500 feet north and 400 feet east of the southwest corner of sec. 14, T. 28 N., R. 41 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to bedrock:** 10 to 20 inches

**Control section:** Clay content—18 to 27 percent; rock

fragments—50 to 80 percent when averaged,  
mainly pebbles

*Reaction throughout the profile:* Mildly alkaline to  
strongly alkaline, becoming more alkaline with depth

*Effervescence:* Slight to strong in the upper part of the  
profile and strong to violent in the lower part

*A horizon:*

Hue—10YR or 2.5Y

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 or 3

*Ck horizon:*

Hue—10YR or 2.5Y

### Landco Series

The Landco series consists of very deep, moderately well drained soils that formed in silty alluvium derived from mixed rock sources mostly of volcanic origin with some influence from volcanic ash. Landco soils are on alluvial flat remnants. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-silty over clayey, mixed  
(calcareous), mesic Typic Torriorthents

**Typical pedon:** Landco silt loam:

A—0 to 5 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderate coarse prismatic structure parting to strong very thin and thin platy; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; many vesicular and very fine interstitial and tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (1 to 5 inches thick)

Cy1—5 to 12 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; moderate coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine tubular pores; strongly effervescent; common fine white (10YR 8/2) filaments or threads of gypsum crystals; strongly alkaline (pH 9.0); clear wavy boundary. (6 to 10 inches thick)

Cy2—12 to 18 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine tubular pores; strongly effervescent; few fine white (10YR 8/2) filaments or threads of gypsum crystals; strongly alkaline (pH 9.0); clear wavy boundary. (6 to 10 inches thick)

2Cy3—18 to 30 inches; very pale brown (10YR 7/3)

silty clay, yellowish brown (10YR 5/4) moist; few fine faint yellowish brown (10YR 5/4 moist) mottles; moderate coarse and very coarse prismatic structure; very hard, friable, very sticky and very plastic; few fine roots; many very fine and fine tubular pores; common thin clay films on peds and in pores; few 5- to 15-millimeter, firm, rounded durinodes; violently effervescent; few fine white (10YR 8/2) filaments or threads of gypsum crystals; strongly alkaline (pH 8.8); gradual wavy boundary. (10 to 15 inches thick)

2Cy4—30 to 44 inches; very pale brown (10YR 7/3) silty clay, yellowish brown (10YR 5/4) moist; few fine faint brown (10YR 4/3 moist) mottles; weak coarse and very coarse prismatic structure; hard, friable, very sticky and very plastic; few very fine roots; common very fine and few fine tubular pores; few thin clay films in pores; violently effervescent; few fine white (10YR 8/2) filaments or threads of gypsum crystals; strongly alkaline (pH 8.6); gradual smooth boundary. (10 to 20 inches thick)

2C—44 to 69 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; common fine faint and distinct brown (7.5YR 4/4 moist) and dark brown (7.5YR 3/2 moist) mottles; massive; slightly hard, friable, sticky and plastic; few very fine roots; common very fine and few fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; approximately 5 miles southeast of Battle Mountain, about 1,000 feet east and 400 feet south of the northwest corner of sec. 11, T. 31 N., R. 45 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in part for short periods from mid-October through mid-May

*Soil temperature:* 47 to 52 degrees F

*Depth to unconformable clayey material:* 15 to 25 inches

*Control section:* Clay content—10 to 18 percent in the upper part, 35 to 45 percent in the lower part; texture—very fine sandy loam or silt loam in the upper part, silty clay loam or silty clay in the lower part

*Other features:* None to common gypsum crystals in any subhorizon

*A horizon:*

Hue—2.5YR or 10YR

Value—6 or 7 dry

Chroma—2 or 3

Structure—platy or prismatic; massive in some pedons

Reaction—moderately alkaline or strongly alkaline

Salts—slightly to strongly salt and sodium affected

*Cy horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

Structure—prismatic; massive in some pedons

Reaction—moderately alkaline to very strongly alkaline, usually becoming less alkaline with depth

Salts—strongly salt and sodium affected

*2C horizon:*

Consistence—slightly hard to very hard dry, very friable or friable moist, and sticky or very sticky and plastic or very plastic wet

Mottles—few or common faint or distinct relict iron mottles

**Laped Series**

The Laped series consists of shallow, well drained soils formed in residuum and colluvium derived from rhyolitic tuffs and andesite. Laped soils are on crests, shoulders, and side slopes of foothills, hills, and summits of plateaus. Slopes are 4 to 30 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Durargids

**Typical pedon:** Laped gravelly loam, 8 to 15 percent slopes, in an area of the Laped-Colbar-Osoll association. Pebbles cover 30 percent of the soil surface:

A1—0 to 3 inches; light gray (10YR 7/2) gravelly loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine vesicular pores; 20 percent pebbles; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 4 inches thick)

A2—3 to 6 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; many very fine and fine vesicular pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 4 inches thick)

Bt—6 to 12 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common medium roots; common very fine and fine

tubular pores; few thin clay films on peds and bridging sand grains; 10 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 7 inches thick)

Btk—12 to 18 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate fine prismatic structure parting to strong fine angular blocky; hard, firm, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; 15 percent pebbles, 5 percent cobbles; few fine strongly effervescent lime filaments and thin lime coatings on undersides of coarse fragments; noneffervescent matrix; moderately alkaline (pH 8.3); abrupt wavy boundary. (0 to 6 inches thick)

Bqkm—18 to 23 inches; white (10YR 8/2) indurated duripan with a 2-millimeter-thick laminae cap; pale brown (10YR 6/3) moist; massive; extremely hard and extremely firm; violently effervescent; clear wavy boundary. (3 to 10 inches thick)

2R—23 inches; hard bedrock.

**Type location:** Lander County, Nevada; approximately 52 miles southwest of Battle Mountain, about 1,800 feet south and 400 feet west of the northeast corner of sec. 22, T. 24 N., R. 40 E.

**Range in Characteristics**

**Soil moisture:** Moist for short periods in winter and early spring, dry from May through October

**Soil temperature:** 47 to 51 degrees F

**Solum thickness and depth to duripan:** 14 to 20 inches

**Depth to bedrock:** 20 to 30 inches

**Control section:** Clay content—27 to 35 percent; rock fragments—15 to 35 percent, mainly pebbles

**Other features:** Thin Bqk horizon above the duripan in some pedons

*A horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

*Bt and Btk horizons:*

Hue—7.5YR or 10YR

Value—5 or 6 dry, 3, 4, or 5 moist

Chroma—4 to 6

Reaction—moderately alkaline in Bt horizon, moderately alkaline or strongly alkaline in Btk horizon

SAR—2 to 10, concentration generally increases with depth

Carbonates—noneffervescent in Bt horizon, noneffervescent to slightly effervescent matrix that has secondary carbonates as filaments or coatings in Btk horizon

## Layview Series

The Layview series consists of shallow, well drained soils formed in residuum and colluvium derived from andesite, rhyolite, and tuff. Layview soils are on crests and shoulders of mountains. Slopes are 4 to 15 percent. Average annual precipitation is approximately 14 inches, and mean annual temperature is 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Argic Lithic Cryoborolls

**Typical pedon:** Layview very gravelly sandy loam, 8 to 15 percent slopes, in an area of the Hapgood-Packer-Layview association, in Lander County, south part. Pebbles cover 50 percent, cobbles 25 percent, and stones 25 percent of the soil surface:

A—0 to 3 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 35 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (3 to 8 inches thick)

Bt1—3 to 7 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 35 percent pebbles; neutral (pH 7.2); clear wavy boundary. (3 to 10 inches thick)

Bt2—7 to 12 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; few fine and common medium roots; few very fine tubular pores; 40 percent pebbles, 10 percent cobbles; neutral (pH 7.2); abrupt irregular boundary. (0 to 8 inches thick)

2R—12 inches; fractured tuff.

**Type location:** Lander County, Nevada, south part; about 41 miles southwest of Austin, approximately 1,700 feet west and 1,100 feet south of northeast corner of sec. 1, R. 33 E., T. 16 N. (part of the BLM private contract completed in Lander County)

### Range in Characteristics

**Soil moisture:** Usually dry in summer and fall, moist from mid-October through mid-July

**Soil temperature:** 43 to 47 degrees F

**Average summer soil temperature:** 50 to 59 degrees F

**Mollic epipedon thickness:** 7 to 12 inches

**Depth to bedrock:** 10 to 14 inches

**Control section:** Clay content—18 to 30 percent; rock fragments—35 to 60 percent, mainly pebbles

**Reaction throughout the profile:** Neutral or mildly alkaline

**A horizon:**

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—weak or moderate

**Bt horizon:**

Value—4 or 5 dry, 3 or 4 moist

Chroma—2 to 4

Texture—very gravelly loam or very gravelly clay loam

Clay content—22 to 35 percent

Structure—weak or moderate subangular or angular blocky

Rock fragments—35 to 60 percent, mainly pebbles

## Linrose Series

The Linrose series consists of moderately deep, well drained soils that formed in residuum and colluvium derived from shale, chert, and quartzite. Linrose soils are on side slopes of mountains. Slopes are 30 to 75 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic Haploxerolls

**Typical pedon:** Linrose gravelly loam, 30 to 50 percent slopes, in an area of Linrose-Cleavage-Pernty association. Pebbles cover 30 percent and cobbles 10 percent of the soil surface:

A1—0 to 2 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine vesicular and few very fine tubular pores; 15 percent pebbles, 10 percent cobbles, and 1 percent stones; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 5 inches thick)

A2—2 to 8 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and plastic; many very fine and few fine roots; common very fine tubular pores; 25 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 11 inches thick)

Bk1—8 to 16 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 3/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; 45 percent pebbles; few thin lime coatings on undersides of pebbles; slightly

effervescent; mildly alkaline (pH 7.6); clear smooth boundary. (4 to 10 inches thick)

**Bk2**—16 to 26 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 3/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; 45 percent pebbles, 10 percent cobbles; few thin lime coatings on the underside of pebbles and cobbles; slightly effervescent; mildly alkaline (pH 7.8); abrupt wavy boundary. (8 to 15 inches thick)

**2R**—26 inches; fractured chert.

**Type location:** Lander County, Nevada; about 9 miles west of Battle Mountain at a site 1,000 feet north and 1,500 feet east of the approximate southwest corner of sec. 26, T. 32 N., R. 43 E.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from July through October

*Soil temperature:* 44 to 47 degrees F

*Mollic epipedon:* 7 to 15 inches thick

*Depth to unweathered bedrock:* 20 to 40 inches

*Control section:* Texture: Very gravelly loam and very gravelly sandy loam; rock fragments—averages 35 to 60 percent, mainly pebbles; clay content—averages 18 to 27 percent

*Reaction throughout the profile:* Mildly alkaline or moderately alkaline

*A horizon:*

Chroma—2 or 3

*Bk horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4 dry, 2 to 4 moist

Carbonates—noneffervescent or slightly effervescent matrix; fine thin lime filaments or lime coatings on undersides of rock fragments in most pedons

### Locane Series

The Locane series consists of shallow, well drained soils that formed in residuum derived from shale and tuffaceous or siliceous conglomerate. Locane soils are on side slopes of mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Xerollic Haplargids

**Typical pedon:** Locane gravelly loam, 8 to 15 percent slopes, in an area of Locane-Coztur-Punchbowl association, in Lander County, south part. Pebbles

cover 40 percent and cobbles 10 percent of the soil surface:

**A1**—0 to 4 inches; very pale brown (10YR 7/3) gravelly loam, dark brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine vesicular pores; 30 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (3 to 6 inches thick)

**A2**—4 to 6 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 25 percent pebbles; neutral (pH 7.2); clear smooth boundary. (0 to 3 inches thick)

**Bt1**—6 to 9 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few fine and medium roots; common very fine tubular pores; many thin and few moderately thick clay films on faces of peds; 35 percent pebbles, 5 percent cobbles; neutral (pH 7.2); clear wavy boundary. (1 to 5 inches thick)

**Bt2**—9 to 14 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; strong medium angular blocky structure; hard, friable, very sticky and very plastic; few fine and medium roots; few very fine tubular pores; many thin and moderately thick clay films on faces of peds; 45 percent pebbles, 10 percent cobbles; neutral (pH 7.0); abrupt irregular boundary. (5 to 12 inches thick)

**R**—14 inches; hard, slightly fractured tuffaceous conglomerate.

**Type location:** Lander County, Nevada, south part; about 30 miles west of Austin, approximately 700 feet south and 2,000 feet east of the projected northwest corner of sec. 26, T. 18 N., R. 38 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in the winter and spring

*Soil temperature:* 44 to 47 degrees F

*Depth to bedrock:* 10 to 20 inches

*Reaction throughout the profile:* Slightly acid or neutral

*A horizon:*

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—granular, platy, or subangular blocky

Consistence—slightly hard or hard dry

**Bt horizon:**

Hue—10YR or 7.5YR  
 Value—4 or 5 dry, 3 or 4 moist  
 Chroma—2 to 4  
 Structure—weak to strong angular blocky;  
     subangular blocky; massive in some pedons  
 Thickness—7 to 15 inches  
 Clay content—35 to 50 percent  
 Rock fragments—35 to 50 percent when averaged

**Loncan Series**

The Loncan series consists of moderately deep, well drained soils that formed in residuum and colluvium derived mainly from chert or sedimentary and volcanic rock sources. Loncan soils are on side slopes of mountains. Slopes are 4 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual air temperature is 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic Haploxerolls

**Typical pedon:** Loncan gravelly loam, 15 to 50 percent slopes, in an area of the Loncan-Gando-Glean association, in Lander County, south part. Pebbles cover 30 percent and cobbles 5 percent of the soil surface:

- A1—0 to 4 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine interstitial pores; 25 percent pebbles, 5 percent cobbles; neutral (pH 6.8); clear smooth boundary. (2 to 10 inches thick)
- A2—4 to 9 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate very fine granular structure; soft, very friable, sticky and plastic; common very fine roots; common very fine tubular pores; 30 percent pebbles; neutral (pH 6.8); clear smooth boundary. (4 to 10 inches thick)
- A3—9 to 16 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, sticky and plastic; common medium and coarse roots; common very fine interstitial pores; 45 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear wavy boundary. (0 to 7 inches thick)
- C—16 to 22 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; massive; soft, very friable, sticky and plastic; few fine roots; few very fine interstitial pores; 65 percent pebbles,

5 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (5 to 13 inches thick)

2R—22 inches; hard chert.

**Type location:** Lander County, Nevada, south part; about 55 miles south of Beowawe, approximately 2,000 feet east and 1,100 feet south of the northwest corner of sec. 5, T. 22 N., R. 48 E. (part of the BLM private contract completed in Lander County)

**Range in Characteristics**

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 42 to 47 degrees F

**Mollic epipedon thickness:** 10 to 17 inches

**Depth to bedrock:** 21 to 38 inches

**Control section:** Clay content—18 to 27 percent; texture—very gravelly loam, extremely cobbly loam, very gravelly sandy clay loam, or extremely gravelly loam; rock fragments—averages 50 to 70 percent pebbles and cobbles and very few stones

**Other features:** Some pedons have an AC horizon

**A horizon:**

Value—4 or 5 dry

Chroma—2 or 3

Structure—platy, subangular blocky, or granular

**C horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—2, 3, or 4

Rock fragments—40 to 70 percent pebbles and cobbles

**Loncan Variant**

The Loncan Variant consists of moderately deep, well drained soils that formed in residuum and colluvium derived from chert. Loncan Variant soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic Haploxerolls

**Typical pedon:** Loncan Variant gravelly silt loam, 30 to 50 percent slopes, in an area of the Rock outcrop-Loncan Variant-Glean association:

- A1—0 to 2 inches; brown (10YR 5/3) gravelly silt loam, dark brown (10YR 3/3) moist; weak very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 20 percent pebbles; neutral (pH 7.2); clear smooth boundary. (1 to 7 inches thick)

A2—2 to 6 inches; brown (10YR 5/3) gravelly silt loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (3 to 6 inches thick)

A3—6 to 12 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine tubular pores; 25 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (4 to 8 inches thick)

C1—12 to 25 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium roots; common very fine tubular pores; 45 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (8 to 14 inches thick)

C2—25 to 32 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, slightly sticky and nonplastic; many very fine, common fine, and few medium roots; common very fine tubular and few very fine interstitial pores; 50 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (4 to 10 inches thick)

R—32 inches; unweathered chert.

**Type location:** Lander County, Nevada; approximately 18 miles south of Battle Mountain, about 1,000 feet south and 500 feet west of the northeast corner of sec. 23, T. 29 N., R. 46 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 43 to 47 degrees F

*Mollic epipedon thickness:* 10 to 20 inches

*Depth to bedrock:* 20 to 40 inches

*Control section:* Clay content—10 to 18 percent; rock fragments—45 to 65 percent when mixed, dominantly pebbles; texture—very gravelly loam or extremely gravelly sandy loam

### Malpais Series

The Malpais series consists of very deep, well drained soils that formed in alluvium and colluvium

derived from mixed rock sources. Malpais soils are on toe slopes of hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Camborthids

**Typical pedon:** Malpais gravelly loam, 30 to 50 percent slopes, in an area of the Trunk-Malpais-Minat association. Pebbles cover 15 percent and cobbles and stones 10 percent of the soil surface:

A—0 to 3 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; weak thick platy structure parting to very thin platy; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial, common very fine and fine tubular, and many very fine vesicular pores; 20 percent pebbles, 10 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 6 inches thick)

Bw1—3 to 6 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate thin platy structure parting to moderate fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 25 percent pebbles, 15 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (3 to 10 inches thick)

Bw2—6 to 15 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate fine and very fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; 40 percent pebbles, 15 percent cobbles; few fine strongly effervescent filaments and common thin lime coatings on undersides of rock fragments; noneffervescent matrix; moderately alkaline (pH 8.2); clear wavy boundary. (9 to 25 inches thick)

Bk1—15 to 25 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine pores; 30 percent pebbles, 30 percent cobbles; many strongly effervescent fine lime filaments and soft masses and common thin lime coatings on rock fragments; slightly effervescent matrix; moderately alkaline (pH 8.4); gradual wavy boundary. (8 to 30 inches thick)

Bk2—25 to 60 inches; light yellowish brown (10YR 6/4) extremely cobbly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and

fine roots; common very fine and fine tubular pores; 35 percent pebbles, 30 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 34 miles south of Battle Mountain, approximately 500 feet east and 1,580 feet south of the northwest corner of sec. 30, T. 26 N., R. 44 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in part for short periods from mid-October through mid-May

**Soil temperature:** 47 to 52 degrees F

**Depth to base of the Bw horizon:** 15 to 35 inches

**Depth to segregated carbonates:** 6 to 25 inches

**Control section:** Clay content—10 to 18 percent; texture—loam, fine sandy loam, or sandy loam, modified by pebbles, cobbles, stones, or boulders; rock fragments—50 to 70 percent, mainly cobbles and stones

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak, thin to thick platy or fine to coarse subangular blocky; massive in some pedons

Reaction—neutral to moderately alkaline

Effervescence—typically noneffervescent but slightly effervescent in some pedons subject to recharge from dust

Other features—dry value of 5 only in the uppermost 1 or 2 inches

#### Bw horizon:

Value—5 or 6 dry, 3, 4, or 5 moist

Chroma—2 or 3

Structure—weak to moderate, thin platy or medium or coarse prismatic; subangular blocky; massive in some pedons

Consistence—soft to hard dry and very friable or friable moist

Reaction—neutral to moderately alkaline

Effervescence—noneffervescent to slight; noneffervescent matrix in pedons with thin lime coatings on undersides of rock fragments

Other features—values of 5 dry and 3 moist reflect lithochromic colors

#### Bk horizon:

Hue—10YR or 2.5Y

Value—5, 6, or 7 dry, 3, 4, or 5 moist

Chroma—2, 3, or 4

Reaction—moderately alkaline or strongly alkaline

Secondary lime—few to many lime coated rock fragments; soft seams and filaments of lime

Other features—values of 5 dry and 3 moist reflect lithochromic colors

### McConnel Series

The McConnel series consists of very deep, somewhat excessively drained soils that formed in alluvium derived from mixed rock sources with a component of loess and volcanic ash over lacustrine beach sediments or gravelly alluvium. McConnel soils are on inset fans and offshore bars. Slopes are 0 to 4 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Xerollic Camborthids

**Typical pedon:** McConnel loam, 0 to 4 percent slopes, in an area of the Tulase-Bubus-McConnel association. Pebbles cover 20 percent of the soil surface:

A1—0 to 2 inches; gray (10YR 6/1) loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure parting to weak very fine granular; soft, very friable, nonsticky and nonplastic; many fine roots and common medium roots; common very fine tubular pores; 10 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (1 to 5 inches thick)

A2—2 to 6 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak thick platy structure parting to weak very fine granular; slightly hard, friable, slightly sticky and nonplastic; many fine and common medium roots; common very fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (4 to 10 inches thick)

Bw—6 to 12 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; common very fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (5 to 8 inches thick)

2Bk1—12 to 18 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and medium roots; few very fine tubular pores; 55 percent pebbles; very thin lime coatings on undersides of pebbles; slightly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (4 to 7 inches thick)

3Bk2—18 to 28 inches; light brownish gray (10YR 6/2) extremely gravelly loamy coarse sand, grayish brown (10YR 5/2) moist; single grained; loose, nonsticky and nonplastic; common fine and medium roots; many fine interstitial pores; 65 percent pebbles; thin lime coatings on undersides of pebbles; strongly effervescent; moderately alkaline



(pH 8.4); gradual wavy boundary. (4 to 15 inches thick)

3Bk3—28 to 60 inches; pale brown (10YR 6/3) extremely gravelly coarse sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few fine and medium roots; many fine interstitial pores; 70 percent pebbles; few thin lime coatings on the undersides of pebbles; strongly effervescent; very strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada; about 38 miles southeast of Battle Mountain, approximately 1,500 feet north of the southeast corner of sec. 30, T. 26 N., R. 48 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 50 to 54 degrees F

*Depth to 2Bk horizon:* 10 to 20 inches

*Control section:* Clay content—averages up to 5 percent; rock fragments—averages 50 to 80 percent, mainly pebbles

*Upper part of control section:* Texture—stratified very fine sandy loam to extremely gravelly sandy loam or sandy loam; rock fragments—up to 70 percent in any one stratum, mainly pebbles

*Lower part of control section:* Texture—stratified very gravelly loamy sand to extremely gravelly coarse sand; rock fragments—60 to 85 percent in any one stratum, mostly pebbles

#### A horizon:

Hue—10YR or 2.5Y

Value—5 or 6 dry, 3 or 4 moist (5 dry and 3 moist only in the uppermost 3 inches)

Chroma—1 to 3

Structure—weak or moderate, thin to thick platy or fine to coarse granular; massive in some pedons

Reaction—neutral to moderately alkaline

#### Bw horizon:

Hue—10YR or 2.5Y

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 to 4 (1 if dark sand grains are present)

Texture—loam, sandy loam, fine sandy loam

Structure—very fine to medium granular or subangular blocky; massive in some pedons

Reaction—neutral to moderately alkaline

#### 2Bk and 3Bk horizons:

Hue—10YR or 2.5Y

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 to 4 (1 if dark sand grains are present)

Reaction—moderately alkaline to very strongly alkaline

## McVegas Series

The McVegas series consists of shallow, well drained soils that formed in residuum derived from metavolcanic and volcanic rocks. McVegas soils are on hills. Slopes are 15 to 30 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic, shallow Haplic Nadurargids

**Typical pedon:** McVegas very cobbly loam, 15 to 30 percent slopes, in an area of the McVegas-Stingdorn-Colbar association. Pebbles cover 10 percent and cobbles 30 percent of the soil surface:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few medium roots; many fine vesicular pores; 30 percent cobbles, 20 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 3 inches thick)

A2—2 to 5 inches; light brownish gray (10YR 6/2) cobbly loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; few medium roots; many very fine tubular pores; 15 percent pebbles, 15 percent cobbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 5 inches thick)

Btn—5 to 10 inches; brown (10YR 5/3) very cobbly silty clay, dark brown (10YR 3/3; 4/3 crushed) moist; weak medium prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; few medium roots; common fine tubular pores; thick continuous clay films on peds; 25 percent pebbles, 15 percent cobbles; strongly alkaline (pH 8.8); clear wavy boundary. (3 to 7 inches thick)

Btnk—10 to 19 inches; light yellowish brown (10YR 6/4) very cobbly silty clay, dark yellowish brown (10YR 3/4; 4/4 crushed) moist; moderate fine angular blocky structure; very hard, very firm, very sticky and very plastic; few medium roots; common very fine tubular pores; thick continuous clay films on peds; 25 percent pebbles, 20 percent cobbles; common medium lime filaments and threads; strongly effervescent; strongly alkaline (pH 9.0); abrupt irregular boundary. (4 to 10 inches thick)

Bqkm—19 to 22 inches; very pale brown (10YR 7/4) strongly cemented duripan capping bedrock and in cracks in the bedrock with some discontinuous laminar indurated deposits; 50 percent pebbles, 30 percent cobbles essentially in place; strongly

effervescent; abrupt smooth boundary. (1 to 19 inches thick)

R—22 inches; hard volcanic bedrock.

**Type location:** Lander County, Nevada; approximately 30 miles northwest of Austin, about 1,200 feet south and 1,100 feet west of the approximate northeast corner of sec. 30, T. 24 N., R. 42 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in part for short periods from October through May

**Soil temperature:** 47 to 52 degrees F

**Depth to strongly cemented duripan:** 14 to 20 inches

**Depth to bedrock:** 15 to 35 inches

**Control section:** Clay content—35 to 45 percent; rock fragments—35 to 60 percent, mainly cobbles

**Reaction throughout the profile:** Moderately alkaline to very strongly alkaline, usually becoming more alkaline with depth

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—weak to moderate, thin or medium platy

#### B<sub>tn</sub> horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—very cobbly silty clay, very cobbly clay, very cobbly silty clay loam, or very cobbly clay loam

Structure—weak to strong, fine to medium prismatic

Consistence—hard to very hard dry, friable to very firm moist

#### B<sub>tnk</sub> horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—4 or 6

Texture—very cobbly silty clay, very cobbly clay, very cobbly silty clay loam, or very cobbly clay loam

Structure—moderate or strong, fine or medium angular blocky or prismatic structure

Consistence—hard or very hard, friable to very firm

### Midraw Series

The Midraw series consists of shallow, well drained soils that formed in some loess and volcanic ash but mainly in colluvium and residuum derived from rhyolite, andesite, or rhyolitic tuff. Midraw soils are on crests and side slopes of hills and foothills. Slopes are 15 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Xerollic Durargids

**Typical pedon:** Midraw very cobbly loam, 15 to 30 percent slopes, in an area of the Colbar-Midraw association. Pebbles cover 10 percent, cobbles 30 percent, and stones 10 percent of the soil surface:

A1—0 to 4 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine and few medium roots; many very fine and fine vesicular pores; 15 percent pebbles, 20 percent cobbles, 5 percent stones; mildly alkaline (pH 7.6); clear wavy boundary. (2 to 6 inches thick)

A2—4 to 6 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine interstitial pores; 10 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary. (0 to 4 inches thick)

B<sub>t1</sub>—6 to 9 inches; pale brown (10YR 6/3) gravelly clay loam, yellowish brown (10YR 5/4) moist; weak medium prismatic structure; hard, friable, sticky and plastic; common very fine, fine, and medium roots; common very fine and fine and few medium tubular pores; common thin clay films on faces of peds; 10 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); gradual wavy boundary. (3 to 5 inches thick)

B<sub>t2</sub>—9 to 16 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; hard, friable, very sticky and very plastic; common very fine, fine, and coarse roots; common very fine and fine tubular pores; many moderately thick clay films on faces of peds; 20 percent 5- to 20-millimeter, weak and moderate durinodes; 10 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); clear irregular boundary. (6 to 12 inches thick)

B<sub>qkm</sub>—16 to 31 inches; very pale brown (10YR 7/3) indurated duripan, yellowish brown (10YR 5/4) moist; extremely hard, extremely firm; common fine roots forming mat over laminar cap; violently effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (4 to 15 inches thick)

2R—31 inches; fractured andesite.

**Type location:** Lander County, Nevada; about 55 miles southwest of Battle Mountain, approximately 400 feet west and 1,600 feet north of the southeast corner of sec. 17, T. 24 N., R. 40 E.

**Range in Characteristics**

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Solum thickness:* 14 to 20 inches

*Depth to duripan:* 14 to 20 inches

*Depth to bedrock:* 22 to 35 inches

*Control section:* Clay content—35 to 45 percent; rock fragments—15 to 30 percent, mainly pebbles

**A horizon:**

Value: 3, 4, or 5 moist

Chroma—2 or 3

Structure—weak or moderate, thin to thick platy or fine to coarse subangular blocky

Reaction—neutral or mildly alkaline

**Bt horizon:**

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly clay loam or gravelly clay

Rock fragments—15 to 30 percent, mainly pebbles

Reaction—neutral to moderately alkaline

Other features—some pedons have durinodes or pan fragments in the Bt2 horizon

**Bqkm horizon:**

Hue—7.5YR or 10YR

Value—5 to 7 dry, 4 or 5 moist

Chroma—3 or 4

**Millerlux Series**

The Millerlux series consists of shallow, well drained soils that formed in some loess but mainly in residuum and colluvium of basalt and tuff. Millerlux soils are on the plateaus. Slopes are 8 to 30 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid Lithic Xerollic Haplargids

**Typical pedon:** Millerlux very cobbly loam, 8 to 15 percent slopes, in an area of Susie Creek-Millerlux association. Cobbles cover 40 percent of the soil surface:

A1—0 to 5 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; slightly hard, friable, sticky and plastic; many fine and very fine roots; many fine and very fine tubular pores; 15 percent cobbles, 20 percent pebbles; neutral (pH 7.0); clear smooth boundary. (0 to 6 inches thick)

A2—5 to 10 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky

structure; slightly hard, friable, sticky and plastic; many fine and very fine roots; many fine and very fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (0 to 4 inches thick)

Bt—10 to 15 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; strong fine prismatic structure; hard, firm, very sticky and very plastic; common very fine and fine roots; few very fine tubular pores; 10 percent pebbles, 2 percent cobbles; common thin clay films on faces of peds; moderately alkaline (pH 8.0); abrupt smooth boundary. (3 to 13 inches thick)

R—15 inches; basalt.

**Type location:** Lander County Nevada; about 10 miles northeast of Battle Mountain, approximately 2,000 feet north and 2,500 feet west of the southeast corner of sec. 2, T. 33 N., R. 46 E.

**Range in Characteristics**

*Soil moisture:* Usually dry from late June through mid-October, moist in winter and spring

*Soil temperature:* 43 to 47 degrees F

*Solum thickness and depth to bedrock:* 12 to 20 inches

**A horizon:**

Value—5, 6, or 7 dry, 3 or 4 moist

Chroma—2 or 3

Reaction—usually neutral or mildly alkaline, but moderately alkaline in some pedons

**Bt horizon:**

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3, 4, or 5 moist

Chroma—3, 4, or 6, but may be 2 dry in upper part

Clay content—40 to 60 percent

Structure—fine to coarse prismatic or angular blocky

Rock fragments—less than 15 percent, mainly pebbles

Reaction—neutral to moderately alkaline

This soil is a taxadjunct to the Millerlux series because of the absence of carbonates in the lower part of the Bt horizon. The Millerlux series has carbonates in the lower part of the Btk horizon. Use and management are the same.

**Minat Series**

The Minat series consists of very deep, well drained soils formed in some volcanic ash but mainly in colluvium of chert, shale, and mixed volcanic rocks. Minat soils are on side slopes of hills and mountains.

Slopes are 15 to 75 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Xerollic Camborthids

**Typical pedon:** Minat very cobbly sandy loam, 30 to 50 percent slopes, in an area of the Minat-Bojo-Stingdorn association. Pebbles cover 45 percent and cobbles 25 percent of the soil surface:

A1—0 to 3 inches; pale brown (10YR 6/3) very cobbly sandy loam, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common fine tubular pores; 30 percent pebbles, 20 percent cobbles; moderately alkaline (pH 7.8); gradual smooth boundary. (3 to 6 inches thick)

A2—3 to 9 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common fine tubular pores; 35 percent pebbles; moderately alkaline (pH 8.0); gradual wavy boundary. (0 to 6 inches thick)

Bw1—9 to 19 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; common fine tubular pores; 50 percent pebbles; moderately alkaline (pH 8.0); gradual wavy boundary. (6 to 12 inches thick)

Bw2—19 to 27 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and few fine and medium roots; few fine tubular pores; 40 percent pebbles; effervescent in spots; lime coatings on undersides of pebbles; moderately alkaline (pH 8.4); gradual wavy boundary. (6 to 12 inches thick)

Bqk1—27 to 44 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, sticky and plastic; common very fine and few fine and medium roots; 50 percent pebbles; 15 percent weakly cemented durinodes; lime coatings on pebbles; strongly effervescent; strongly alkaline (pH 8.6); gradual wavy boundary. (7 to 19 inches thick)

Bqk2—44 to 60 inches; very pale brown (10YR 7/3) very gravelly fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly

sticky and nonplastic; many very fine roots; 50 percent pebbles; 15 percent weakly cemented durinodes; common medium soft lime masses and coatings on pebbles; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 32 miles south of Battle Mountain in an unsectionized area, approximately 2,600 feet south and 1,500 feet east of the northwest corner of sec. 6, T. 24 N., R. 42 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 50 degrees F

*Thickness of A and Bw horizons:* 20 to 30 inches

*Depth to carbonates:* 18 to 27 inches

*Control section:* Clay content—15 to 27 percent; rock fragments—35 to 60 percent, predominantly pebbles

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Reaction—Mildly alkaline or moderately alkaline

Other features—some pedons have carbonate recharge in the A1 horizon

#### Bw horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Reaction—mildly alkaline or moderately alkaline

#### Bqk horizon:

Value—6 or 7 dry, 4 to 6 moist

Chroma—3 or 4

Cementation—up to 15 percent weakly cemented durinodes

Reaction—moderately alkaline or strongly alkaline

### Misad Series

The Misad series consists of very deep, well drained soils that formed in some loess high in content of volcanic ash but mainly in alluvium or lake shore sediments of mixed rock sources. Misad soils are on alluvial fans, fan skirts, inset fans, and offshore bars. Slopes are 0 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Durorthidic Torriorthents

**Typical pedon:** Misad gravelly sandy loam, strongly saline-sodic:

A1—0 to 3 inches; pale brown (10YR 6/3) gravelly sandy loam, dark brown (10YR 3/3) moist;

moderate thin and medium platy structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine roots; many very fine vesicular and tubular pores; 20 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (2 to 5 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine and common fine roots; many very fine vesicular and tubular pores; 30 percent pebbles; slightly effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (4 to 8 inches thick)

Bq—7 to 14 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; common fine distinct brown (7.5YR 5/4 and 4/4 moist) relict mottles; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and few fine and medium roots; many very fine tubular pores; 10 percent pebbles; 15 percent 5- to 15-millimeter, weakly cemented durinodes; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 15 inches thick)

Bqk1—14 to 26 inches; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 4/3) moist; common fine distinct brown (7.5YR 5/4 and 4/2 moist) relict mottles; massive; slightly hard, very friable, nonsticky and slightly plastic; very few very fine and fine roots; common very fine tubular pores; 25 percent pebbles; 35 percent 5- to 30-millimeter, weakly and strongly cemented durinodes; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (7 to 24 inches thick)

Bqk2—26 to 31 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; few fine distinct brown (7.5YR 5/4 and 4/2 moist) relict mottles; massive; slightly hard, very friable, nonsticky and slightly plastic; very few very fine roots; many very fine tubular pores; 45 percent pebbles; 10 percent 5- to 15-millimeter, weakly cemented durinodes; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (4 to 22 inches thick)

2C—31 to 43 inches; pale brown (10YR 6/3) very gravelly loamy coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; very few very fine roots; many very fine interstitial and tubular pores; 55 percent pebbles; strongly alkaline (pH 9.0); clear wavy boundary. (0 to 16 inches thick)

2Cq—43 to 60 inches; variegated extremely gravelly coarse sand; single grained; loose, nonsticky and nonplastic; very few fine roots; 75 percent pebbles;

few horizontal, 2- to 3-inch-thick, discontinuous, strongly silica-cemented lenses; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; approximately 2.6 miles southeast of Battle Mountain, about 2,500 feet east and 1,000 feet south of the approximate northwest corner of sec. 27, T. 32 N., R. 45 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and early spring

*Soil temperature:* 47 to 51 degrees F

*Depth to Bqk horizon with more than 20 percent durinodes:* 8 to 25 inches

*Depth to unconformable 2C horizon:* 20 to 35 inches

*Control section:* Texture—sandy loam, fine sandy loam, very fine sandy loam, loamy coarse sand, and loamy sand; rock fragments—35 to 50 percent, mainly pebbles

*Reaction throughout the profile:* Normally calcareous, commonly noneffervescent in the surface or in the lower part of the profile

*Relict iron mottles:* Common in any horizon below a depth of 7 inches

*A horizon:*

Hue—2.5Y or 10YR

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 or 3

*Bq and Bqk horizons:*

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—2, 3, or 4

Durinodes—10 to 40 percent, weakly to strongly cemented

*2C horizon:*

Texture—loamy sand, sand, loamy coarse sand

Rock fragments—50 to 70 percent, mainly pebbles

Cementation—commonly has discontinuous, weakly or strongly silica-cemented lenses between pebbles in any layer

Effervescence—noneffervescent to strongly effervescent

### Needle Peak Series

The Needle Peak series consists of very deep, somewhat poorly drained soils that formed in some loess and volcanic ash but mainly in alluvium derived from mixed rock sources. Needle Peak soils are on inset fans and flood plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aquic Torriorthents

**Typical pedon:** Needle Peak silt loam, occasionally flooded, 0 to 2 percent slopes, in an area of Bubus-Needle Peak-Yipor association:

- A1—0 to 4 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; strong thin and medium platy structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (3 to 9 inches thick)
- A2—4 to 9 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine and medium roots; many very fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 9 inches thick)
- Ck1—9 to 16 inches; light gray (10YR 7/2) silt loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and few fine and medium roots; many very fine tubular pores; 15 percent weakly cemented durinodes; violently effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (7 to 20 inches thick)
- Ck2—16 to 27 inches; light gray (10YR 7/2) silt loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and few fine and medium roots; many very fine tubular pores; 15 percent weakly cemented durinodes; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (10 to 24 inches thick)
- Ck3—27 to 49 inches; light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; common fine faint dark yellowish brown (10YR 4/4 moist) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine and coarse roots; many very fine tubular pores; 10 percent weakly cemented durinodes; few fine soft lime masses; violently effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (0 to 24 inches thick)
- 2Ck4—49 to 60 inches; light gray (10YR 7/2) sandy loam, grayish brown (10YR 5/2) moist; few fine faint dark yellowish brown (10YR 4/4 moist) mottles; massive; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; many very fine tubular pores; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 20 miles

southeast of Battle Mountain, approximately 1,500 feet south of the northeast corner of sec. 19, T. 30 N., R. 43 E.

### Range in Characteristics

*Soil moisture:* Seasonal high water table at a depth of 4 to 6 feet

*Soil temperature:* 47 to 52 degrees F

*Depth to lime:* Less than 10 inches

*Control section:* Clay content—20 to 35 percent; texture—silt loam or silty clay loam

*Other features:* Mottling below a depth of 20 inches in most pedons

#### A horizon:

Hue—10YR or 2.5Y

Value—3 or 4 moist

Chroma—2 or 3

Structure—platy or subangular blocky

Reaction—mildly alkaline to strongly alkaline

Other features—slightly effervescent in some pedons

#### Ck horizon:

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 or 3

Structure—angular blocky or subangular blocky; or massive in some pedons

Reaction—moderately alkaline to very strongly alkaline

### Newpass Series

The Newpass series consists of moderately deep, well drained soils that formed in some loess but mainly in residuum of volcanic and metavolcanic rocks. Newpass soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Haploxerollic Nadurargids

**Typical pedon:** Newpass loam, 30 to 50 percent slopes, in an area of the Burrita-Alley-Newpass association:

- A1—0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; many fine and very fine vesicular pores; 10 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 6 inches thick)

- A2—2 to 5 inches; pale brown (10YR 6/3) loam, brown

(10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine roots; many very fine and common fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.0); abrupt smooth boundary. (0 to 3 inches thick)

**Btn**—5 to 17 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 4/4) moist; moderate fine prismatic structure; hard, firm, very sticky and very plastic; common fine and very fine roots; common very fine tubular pores; 10 percent pebbles; moderately thick clay films on faces of peds; very strongly alkaline (pH 9.6); clear wavy boundary. (3 to 12 inches thick)

**Btk**—17 to 24 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; common very fine and few fine tubular pores; 25 percent pebbles, 5 percent cobbles; moderately thick clay films on faces of peds; common medium soft masses of lime, lime coating all surfaces of rock fragments; strongly effervescent; very strongly alkaline (pH 9.4); abrupt wavy boundary. (2 to 7 inches thick)

**Bqkm**—24 to 34 inches; white (10YR 8/2) strongly cemented duripan, very pale brown (10YR 8/3) moist; massive; very hard, very firm; few very fine roots in cracks; few very fine tubular pores; 15 percent pebbles; lime coatings on rock fragments; violently effervescent; very strongly alkaline (pH 9.6); abrupt wavy boundary. (0.5 inch to 12 inches thick)

**R**—34 inches; andesite.

**Type location:** Lander County, Nevada; approximately 6 miles northeast of Battle Mountain, about 1,700 feet east and 1,800 feet north of the southwest corner of sec. 14, T. 33 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-June through October

**Soil temperature:** 47 to 52 degrees F

**Depth to duripan:** 20 to 29 inches

**Depth to bedrock:** 21 to 36 inches

**Control section:** Clay content—45 to 60 percent; rock fragments—averages 15 to 35 percent, less than 15 percent (mainly pebbles) in the upper part and 25 to 50 percent (mainly pebbles and cobbles) in the lower part

**A horizon:**

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 or 3

Structure—platy or subangular blocky

Reaction—mildly alkaline or moderately alkaline

**Btn and Btk horizons:**

Hue—10YR or 7.5YR

Value—4 or 5 dry (may be 6 in the upper part), 3 or 4 moist

Chroma—3, 4, or 6

Reaction—moderately alkaline to very strongly alkaline, commonly becoming more alkaline with depth

Exchangeable sodium—15 to 30 percent in Bn horizon; 5 to 15 percent in Bk horizon

### Ninemile Series

The Ninemile series consists of shallow, well drained soils that formed in some volcanic ash but mainly in residuum and colluvium derived from andesite, basalt, and tuffs. Ninemile soils are on side slopes of stable mountains. Slopes are 15 to 30 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Ninemile extremely cobbly loam, 15 to 30 percent slopes, in an area of the Robson-Ninemile-Ravenswood association, in Lander County, south part. Pebbles cover 25 percent and cobbles and stones 50 percent of the soil surface:

**A1**—0 to 4 inches; dark brown (10YR 4/3) extremely cobbly loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine interstitial pores; 20 percent pebbles, 40 percent cobbles and stones; neutral (pH 7.0); abrupt wavy boundary. (1 to 7 inches thick)

**A2**—4 to 7 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate very fine and fine granular structure; slightly hard, friable, sticky and plastic; common fine and few very fine and medium roots; common fine interstitial pores; 10 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (0 to 6 inches thick)

**Bt1**—7 to 14 inches; dark brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; strong fine and medium prismatic structure; hard, firm, very sticky and very plastic; common medium and few fine expd roots along faces of peds; common fine and few very fine tubular pores; common moderately thick clay films

lining pores and on faces of peds; 10 percent cobbles; neutral (pH 6.8); clear wavy boundary. (3 to 9 inches thick)

**Bt2**—14 to 19 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium angular blocky; hard, firm, very sticky and very plastic; few fine roots; few very fine tubular pores; many thick pressure faces; 10 percent cobbles; neutral (pH 6.8); abrupt wavy boundary. (4 to 7 inches thick)

**R**—19 inches; fractured andesite.

**Type location:** Lander County, Nevada, south part; about 16 miles northeast of Austin, approximately 1,200 feet east and 1,300 feet north of the southwest corner of sec. 28, T. 19 N., R. 46 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 44 to 47 degrees F

**Mollic epipedon:** 6 to 15 inches thick, commonly includes part or all of the argillic horizon

**Depth to bedrock:** 10 to 20 inches

**Control section:** Clay content—averages 40 to 60 percent; reaction—slightly acid to mildly alkaline

#### A horizon:

Value—3 to 5 dry, 2 or 3 moist

Chroma—1 to 3

Structure—thin to thick platy or granular

Consistence—soft or slightly hard dry, nonsticky to slightly sticky and nonplastic to plastic wet

Reaction—slightly acid to mildly alkaline

Other features—uppermost 1 or 2 inches of some pedons has color value of 6 and is massive

#### Bt horizon:

Hue—5YR, 7.5YR, or 10YR

Value—3 to 6 dry, 3 or 4 moist

Chroma—2, 3, or 4

Clay content—40 to 60 percent

Texture—clay or gravelly clay

Rock fragments—0 to 30 percent pebbles or cobbles

Structure—moderate or strong subangular blocky, angular blocky, or prismatic; massive in the Bt2 horizon of some pedons

#### R horizon:

Other features—in some pedons where the depth to bedrock is less than 15 inches, the uppermost 1 to 3 inches of bedrock is weathered

## Norfolk Series

The Norfolk series consists of shallow, well drained soils that formed in some mixed loess and volcanic ash but mainly in residuum and colluvium derived from basalt, andesite, rhyolite, and metamorphic rocks. Norfolk soils are on side slopes of hills. Slopes are 15 to 30 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is 46 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Xerollic Durargids

**Typical pedon:** Norfolk gravelly loam, 15 to 30 percent slopes, in an area of the Jung-Norfolk-Buffaran association. Pebbles cover 25 percent and cobbles 5 percent of the soil surface:

**A**—0 to 3 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots; common very fine and fine interstitial pores; 20 percent pebbles, 10 percent cobbles; neutral (pH 7.2); abrupt smooth boundary. (2 to 4 inches thick)

**Bt1**—3 to 7 inches; brown (10YR 5/3) gravelly silty clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, friable, sticky and plastic; many very fine and fine and common medium roots; many very fine and fine interstitial pores; many thin clay films on faces of peds and lining pores; 20 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (2 to 5 inches thick)

**Bt2**—7 to 14 inches; yellowish brown (10YR 5/4) gravelly silty clay, dark yellowish brown (10YR 4/4) moist; strong fine subangular blocky structure; hard, firm, very sticky and very plastic; common thin clay films lining pores and common thick clay films on faces of peds; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (3 to 7 inches thick)

**Bqk**—14 to 17 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; few fine roots; few fine tubular pores; common thick silica pendants on undersides of rock fragments; 20 percent pebbles, 5 percent cobbles; many medium seams of secondary carbonates; violently effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (0 to 4 inches thick)

**Bqkm**—17 to 22 inches; very pale brown (10YR 7/3) indurated duripan, light yellowish brown (10YR 6/4) moist; massive; extremely hard, extremely firm; 2-



to 6-millimeter-thick laminar cap and thin silica horizontal bands at intervals throughout horizon; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (5 to 20 inches thick)

R—22 inches; quartzite.

**Type location:** Lander County, Nevada; about 25 miles south of Battle Mountain, approximately 2,000 feet west and 2,500 feet north of the southeast corner of sec. 12, T. 28 N., R. 46 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Depth to base of Bt horizon:* 7 to 14 inches

*Depth to indurated duripan:* 10 to 20 inches

*Depth to bedrock:* 21 to 40 inches

*Control section:* Clay content—35 to 45 percent; rock fragments—averages 20 to 30 percent, mainly pebbles with as much as 15 percent cobbles

#### A horizon:

Value—5 or 6 dry

Chroma—2 or 3

Structure—platy or granular

Consistence—soft or slightly hard, very friable or friable, nonsticky to sticky and nonplastic to plastic

Reaction—neutral or mildly alkaline

#### Bt horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly silty clay, gravelly silty clay loam, or cobbly silty clay loam

Reaction—neutral to moderately alkaline

#### Bqk horizon (only in some pedons):

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly loam, gravelly silt loam, or gravelly silty clay loam

Rock fragments—20 to 35 percent and as much as 5 percent cobbles

Reaction—Mildly alkaline or moderately alkaline

### Ocala Series

The Ocala series consists of very deep, somewhat poorly drained soils that formed in some volcanic ash but mainly in silty alluvium derived from mixed rock sources. Ocala soils are on flood plains, lake plains, and alluvial flats. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aerlic Halaquepts

**Typical pedon:** Ocala silt clay loam, occasionally flooded, in an area of the Batan-Ocala-Ocala, rarely flooded, association:

A1—0 to 2 inches; light gray (10YR 7/2) silty clay loam, brown (10YR 5/3) moist; moderate medium platy structure; slightly hard, friable, sticky and plastic; few fine roots; common fine vesicular pores; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary. (0 to 6 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; moderate fine granular structure; slightly hard, friable, sticky and plastic; common fine and medium roots; few fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary. (0 to 6 inches thick)

C—6 to 13 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; few fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.2); abrupt wavy boundary. (4 to 18 inches thick)

Cqk1—13 to 18 inches; white (10YR 8/2) silt loam, pale brown (10YR 6/3) moist; few medium faint yellowish brown (10YR 5/4 moist) mottles; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots; few fine tubular pores; 15 percent weakly cemented durinodes; strongly effervescent; strongly alkaline (pH 9.0); abrupt broken boundary. (3 to 8 inches thick)

Cqk2—18 to 26 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; common medium faint dark grayish brown (10YR 4/2 moist) mottles; massive; hard, firm, brittle, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; weak continuous silica cementation; strongly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (3 to 14 inches thick)

Cqk3—26 to 36 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; common medium faint pale brown (10YR 6/3 moist) and grayish brown (10YR 5/2 moist) mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; weak fine tubular pores; 30 percent weak discontinuous cementation; strongly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (0 to 15 inches thick)

Cqk4—36 to 60 inches; white (10YR 8/2) silt loam, pale brown (10YR 6/3) moist; few medium faint yellowish brown (10YR 5/4 moist) mottles; massive; very

hard, very firm, brittle, slightly sticky and slightly plastic; few fine tubular pores; weak continuous silica cementation; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 26 miles southeast of Battle Mountain, approximately 1,000 feet north and 500 feet east of the southwest corner of sec. 19, T. 28 N., R. 48 E.

#### Range in Characteristics

*Soil moisture:* Usually saturated within a depth of 40 inches for 1 month or more in most years

*Soil temperature:* 50 to 54 degrees F

*Depth to weakly cemented horizon:* 13 to 30 inches

*Control section:* Clay content—18 to 35 percent; texture—silty clay loam or silt loam that has thin strata of clay loam, loam, or silty clay in some pedons

*Cementation:* More than one weakly cemented horizon in some pedons; horizons that are 20 to 70 percent durinodes in a friable matrix above the weakly cemented horizons in some pedons

*Reaction throughout the profile:* Strongly or very strongly alkaline

*Salt and sodium:* Normally strongly salt and sodium affected within the uppermost 10 inches; flood irrigated areas affected only below this depth

*Segregated lime:* Lime concretions normally below a depth of 35 inches, not in some pedons

*Iron mottles:* Below a depth of 12 inches

*Other features:* Generally noncalcareous and mildly alkaline strata or lenses of volcanic ash as much as 4 inches thick in most pedons, especially below a depth of 30 inches

#### A horizon:

Hue—10YR to 5Y

Value—6 to 8 dry, 4 to 7 moist

Chroma—1 to 3

Structure—granular or platy

#### C and Cqk horizons:

Hue—10YR to 5Y

Value—6 to 8 dry, 4 to 7 moist

Chroma—1 to 3

Structure—platy; massive in some pedons

### Old Camp Series

The Old Camp series consists of shallow, well drained soils that formed in some volcanic ash but mainly in residuum and colluvium weathered from tuffs, basalt, rhyolite, and andesite. Old Camp soils are on hills and mountains. Slopes are 4 to 75 percent. Mean

annual precipitation is about 10 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Old Camp very gravelly loam, 15 to 30 percent slopes, in an area of the Old Camp-Minat-Osoll association. Pebbles cover 50 percent of the soil surface:

A—0 to 2 inches; brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine vesicular pores; 35 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (1 to 7 inches thick)

Bt—2 to 5 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine and fine interstitial pores; 45 percent pebbles, 10 percent cobbles; few moderately thick clay films on faces of peds; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 7 inches thick)

Btk—5 to 11 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; slightly hard, friable, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; 35 percent pebbles and 5 percent cobbles; common moderately thick clay films on faces of peds and lining pores; few very thin strongly effervescent lime coatings underneath bedrock fragments; moderately alkaline (pH 8.0); abrupt irregular boundary. (4 to 13 inches thick)

R—11 inches; andesite; lime coatings in fractures.

**Type location:** Lander County, Nevada; approximately 14 miles southwest of Battle Mountain, about 1,050 feet south of the northeast corner of sec. 22, T. 31 N., R. 42 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist from November through May

*Soil temperature:* 47 to 52 degrees F

*Depth to bedrock:* 10 to 20 inches

*Control section:* Rock fragments—50 to 75 percent, dominantly cobbles and stones; 35 to 50 percent rock fragments in the upper part in some pedons

#### A horizon:

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak granular; platy; massive in some pedons

Reaction—neutral or mildly alkaline

*Bt horizon:*

Hue—10YR or 7.5YR

Value—4 to 7 dry, 3 to 5 moist

Chroma—2 to 4

Texture—clay loam or sandy clay loam, with subhorizons in some pedons of loam, modified by an average of 50 to 75 percent rock fragments, mainly cobbles or stones

Clay content—27 to 35 percent

Structure—weak or moderate, coarse to fine angular or subangular blocky

Reaction—neutral or mildly alkaline in the upper part, ranges to strongly alkaline in the calcareous lower part

Other features—few to continuous lime coatings on rock fragments or bedrock

This pedon is a taxadjunct to the Old Camp series because it has mainly pebbles in the Bt horizon. In the Old Camp series, cobbles or stones typically modify the Bt horizon.

## Orovada Series

The Orovada series consists of very deep, well drained soils that formed in loess high in content of volcanic ash over alluvium derived from mixed rock sources. Orovada soils are on fan skirts, fan aprons, and inset fans. Slopes are 0 to 15 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Orovada fine sandy loam, 2 to 4 percent slopes:

A1—0 to 4 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; strong coarse prismatic structure parting to platy; slightly hard, very friable, slightly sticky and slightly plastic; many very fine random roots; many very fine vesicular, interstitial, and tubular pores; neutral (pH 7.2); abrupt wavy boundary. (2 to 8 inches thick)

A2—4 to 8 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; weak coarse and very coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine random and few fine and medium oblique roots; common very fine tubular and interstitial pores; mildly alkaline (pH 7.8); clear wavy boundary. (0 to 6 inches thick)

Bw—8 to 20 inches; light gray (10YR 7/2) fine sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine random and very few fine and medium oblique roots; common very fine tubular and many very fine interstitial pores; moderately alkaline (pH 7.8); clear wavy boundary. (4 to 15 inches thick)

Bqk1—20 to 31 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine random and very few fine and medium oblique roots; common very fine tubular and interstitial pores; 15 percent 10- to 30-millimeter, moderately strong durinodes; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (5 to 12 inches thick)

Bqk2—31 to 44 inches; light gray (10YR 7/2) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine random and very few fine and medium oblique roots; few very fine tubular and common very fine interstitial pores; 5 percent pebbles; 25 percent 10- to 30-millimeter, moderately strong durinodes; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (6 to 14 inches thick)

Bqk3—44 to 65 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine tubular and common very fine interstitial pores; 5 percent pebbles; 15 percent 2- to 20-millimeter, moderately strong and strong durinodes; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 9 miles north of Battle Mountain, approximately 1,550 feet east and 1,400 feet north of the southwest corner of sec. 28, T. 34 N., R. 45 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Depth to Bq or Bqk horizon:* 10 to 28 inches

*Control section:* Texture—fine sandy loam, very fine sandy loam, loam, or silt loam that has strata of loamy fine sand or sandy loam in some pedons; clay content—5 to 18 percent; rock fragments—0 to 15 percent, mainly pebbles

*Other features:* Value of the uppermost 7 inches greater than 5.5 dry and 3.5 moist when mixed

*A horizon:*

Hue—10YR or 2.5Y

Value—5, 6, or 7 dry, 3 or 4 moist

Chroma—2 to 4

Structure—platy or prismatic; massive in some pedons

Consistence—soft or slightly hard

Reaction—neutral to moderately alkaline

*Bw horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 to 6

Texture—fine sandy loam, very fine sandy loam, loam, silt loam

Clay content—5 to 18 percent

Rock fragments—averages 0 to 15 percent pebbles

Structure—subangular blocky or prismatic; massive in some pedons

Reaction—mildly alkaline or moderately alkaline

*Bq or Bqk horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 to 6

Rock fragments—up to 30 percent pebbles in some subhorizons of some pedons

Consistence—soft to hard and very friable or friable

Reaction—moderately alkaline to very strongly alkaline, becoming more alkaline with depth

Cementation—20 to 80 percent durinodes

Other features—gypsum crystals below a depth of 37 inches in some pedons; duripans or very gravelly strata below a depth of 40 inches in some pedons

## Osoll Series

The Osoll series consists of shallow, well drained soils that formed in some loess but mainly in residuum and colluvium derived from mixed rock sources. Osoll soils are on side slopes and crests of hills. Slopes are 2 to 50 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Durorthids

**Typical pedon:** Osoll gravelly loam, 2 to 8 percent slopes, in an area of the Laped-Colbar-Osoll association. Pebbles cover 30 percent of the soil surface:

A—0 to 5 inches; light gray (10YR 7/2) gravelly loam, dark brown (10YR 4/3) moist; moderate thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine vesicular pores; 30 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 6 inches thick)

Bqk—5 to 12 inches; very pale brown (10YR 7/3) very gravelly loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine, fine, and medium roots; common very fine and fine interstitial pores; 20 percent 5- to 20-millimeter, weak to moderate durinodes; 30 percent pebbles, 15 percent cobbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (4 to 9 inches thick)

Bqkm—12 to 35 inches; very pale brown (10YR 7/4) cobbly indurated duripan, yellowish brown (10YR 5/4) moist; strong thick plates with massive strata in between; extremely hard, extremely firm; continuous fractured silica-cemented laminae on top and in bands throughout horizon, separated by discontinuous strong and weakly silica-cemented strata with 20 percent 5- to 20-millimeter, hard silica and lime concretions; violently effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (12 to 28 inches thick)

R—35 inches; hard rhyolite; capped with ½-inch-thick, silica-cemented laminae.

**Type location:** Lander County, Nevada; about 52 miles southwest of Battle Mountain, approximately 800 feet north of the southwest corner of sec. 36, T. 24 N., R. 40 E.

### Range in Characteristics

**Soil moisture:** Usually dry, intermittently moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to duripan:** 8 to 14 inches

**Depth to bedrock:** 20 to 40 inches

**Control section:** Texture—very gravelly loam and very gravelly fine sandy loam; clay content—10 to 18 percent; rock fragments—average 35 to 60 percent, mostly pebbles and some cobbles

*A horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Reaction—mildly alkaline or moderately alkaline

*Bqk horizon:*

Durinodes—up to 30 percent, weak to hard in any subhorizon

Reaction—moderately alkaline or strongly alkaline

## Osoll Variant

The Osoll Variant consists of moderately deep, well drained soils that formed in colluvium of basalt and tuff. Osoll Variant soils are on side slopes of hills. Slopes are 8 to 15 percent. Mean annual precipitation is about

7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Durorthids

**Typical pedon:** Osoll Variant gravelly loam, 4 to 15 percent slopes, in an area of the Osoll Variant-Oxcorel association. Pebbles cover 25 percent of the soil surface:

A1—0 to 2 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine vesicular pores; 30 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (1 to 4 inches thick)

A2—2 to 5 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and few very fine and medium roots; common very fine tubular pores; 15 percent 5- to 20-millimeter, weak durinodes; 15 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (2 to 4 inches thick)

Bq—5 to 10 inches; very pale brown (10YR 7/3) gravelly loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and few very fine and medium roots; common very fine tubular pores; 15 percent 5- to 20-millimeter, weak durinodes; 15 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (4 to 7 inches thick)

Bqk1—10 to 17 inches; very pale brown (10YR 7/3) very gravelly loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and few medium roots; common very fine tubular pores; 20 percent 5- to 20-millimeter, weak and moderate durinodes; 40 percent pebbles; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (5 to 10 inches thick)

Bqk2—17 to 26 inches; white (10YR 8/2) very gravelly loam, brownish yellow (10YR 6/6) moist; massive; hard, firm, nonsticky and nonplastic; few very fine roots; few fine tubular pores; 30 percent weak discontinuous silica cementation with 10 percent thin discontinuous strongly silica-cemented horizontal plates; 20 percent 5- to 20-millimeter, strong durinodes; 40 percent pebbles; violently

effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (6 to 10 inches thick)

Bqkm—26 to 40 inches; white (10YR 8/2) indurated duripan, brownish yellow (10YR 6/6) moist; massive; very hard, very firm; few fine roots along fracture planes; continuous thin indurated laminae cap on strongly cemented matrix; 45 percent rock fragments; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** Lander County, Nevada; approximately 45 miles southwest of Battle Mountain, about 600 feet north and 900 feet west of the southeast corner of sec. 31, T. 25 N., R. 42 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist for short periods in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Depth to Bqkm horizon:* 20 to 35 inches

*Control section:* Clay content—15 to 22 percent, when averaged; rock fragments—35 to 50 percent, mostly pebbles

*Effervescence:* Slight to violent, the degree increasing with depth

*A horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

*Bq horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Durinodes—up to 20 percent, weak or strong

*Bqk horizon:*

Value—6 to 8 dry, 5 or 6 moist

Chroma—2 to 6

Cementation—as much as 60 percent weak discontinuous silica cementation, as much as 20 to 50 percent weakly through strongly cemented durinodes in pan fragments, and as much as 30 percent discontinuous strong cementation

### Oxcorel Series

The Oxcorel series consists of very deep, well drained soils formed in some loess but mainly in alluvium derived from mixed rock sources. Oxcorel soils are on summits and side slopes of fan piedmont remnants. Slopes are 2 to 30 percent. Mean annual temperature is about 48 degrees F, and mean annual precipitation is about 6 inches.

**Taxonomic class:** Fine, montmorillonitic, mesic Duric Natrargids

**Typical pedon:** Oxcorel gravelly fine sandy loam, 2 to 4 percent slopes, in an area of the Wieland-Oxcorel-Allor association. Pebbles cover 20 percent and cobbles 5 percent of the soil surface:

A1—0 to 2 inches; light gray (10YR 7/2) gravelly fine sandy loam, brown (10YR 5/3) moist; moderate very thin and thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine and few fine and medium vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 4 inches thick)

A2—2 to 5 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; moderate very thin and thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular and common very fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (3 to 6 inches thick)

Btn1—5 to 10 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate very fine subangular blocky structure; hard, firm, very sticky and very plastic; many very fine roots; common very fine tubular pores; common thin clay films on faces of peds; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 14 inches thick)

Btn2—10 to 13 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; moderate fine prismatic structure; hard, firm, sticky and very plastic; few fine roots; common very fine tubular pores; common thin clay films on faces of peds and lining pores; 5 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 10 inches thick)

Btnk—13 to 20 inches; light yellowish brown (10YR 6/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate fine prismatic structure; hard, firm, sticky and plastic; few very fine roots; common very fine tubular pores; common thin clay films on peds and lining pores; 20 percent pebbles with thin (less than 1 millimeter) lime coatings on undersides; 10 percent weakly cemented durinodes; few fine (1 millimeter or less in diameter) lime filaments in soil matrix; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (4 to 17 inches thick)

Bqk1—20 to 29 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; massive; hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; 45 percent pebbles with thin (less than 1 millimeter) lime coatings on undersides; 25 percent strongly cemented durinodes; few fine (less than 2 millimeter

in diameter) lime filaments in soil matrix; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (8 to 15 inches thick)

Bqk2—29 to 60 inches; very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 50 percent pebbles, 5 percent cobbles; 5 percent cobbles with thin (less than 1 millimeter) lime coatings on undersides; 20 percent weakly cemented durinodes; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada; about 22 miles southeast of Battle Mountain, approximately 1,500 feet north and 1,500 feet west of the southeast corner of sec. 36, T. 29 N., R. 46 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist for short periods in winter and early spring

*Soil temperature:* 47 to 52 degrees F

*Depth to base of natric horizon:* 20 to 40 inches

*Depth to durinodes:* 20 to 34 inches

*Control section:* Texture—clay or clay loam; clay content—35 to 50 percent; rock fragments—0 to 10 percent pebbles in the upper part, 10 to 20 percent pebbles in the lower part

*Other features:* 1/2- to 2-inch-thick E horizon capping the Bt horizon in some pedons

*A horizon:*

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 or 3

*Btn and Btnk horizons:*

Hue—7.5YR or 10YR

Value—5, 6, or 7 dry, 4, 5, or 6 moist

Chroma—3 to 6, chroma of 3 is common in the upper subhorizons of some pedons

Reaction—moderately alkaline to very strongly alkaline

Carbonates—noneffervescent to strongly effervescent matrix in the Btn horizon, segregated lime commonly in the Btnk horizon

Cementation—10 to 30 percent durinodes common in the Btnk horizon

Other features—gypsum common in the Btnk horizon of some pedons

*Bqk horizon:*

Value—5, 6, or 7 dry, 4, 5, or 6 moist

Chroma—3 to 6

Rock fragments—35 to 60 percent

Texture—very gravelly sandy loam or very gravelly loam

Cementation—20 to 60 percent, weakly or strongly cemented durinodes, commonly as much as 30 percent weak discontinuous cementation

Other features—subhorizon that is less than 20 percent durinodes in the upper part of some pedons

### **Packer Series**

The Packer series consist of very deep, well drained soils that formed in some loess and volcanic ash but mainly in residuum weathered from chert, shale, quartzite, and extrusive volcanic rocks. Packer soils are on crests and side slopes of mountains. Slopes are 8 to 50 percent. Mean annual precipitation is about 15 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Argic Cryoborolls

**Typical pedon:** Packer extremely gravelly loam, 15 to 30 percent slopes, in an area of the Packer-Newlands association, in Lander County, south part. Pebbles cover 70 percent and cobbles and stones 20 percent of the soil surface:

A1—0 to 7 inches; brown (10YR 5/3) extremely gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to moderate fine granular; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; common very fine interstitial and tubular pores; 45 percent pebbles, 15 percent cobbles, 5 percent stones; neutral (pH 6.8); clear smooth boundary. (2 to 7 inches thick)

A2—7 to 10 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and fine and common medium roots; common very fine tubular pores; 20 percent pebbles, 20 percent cobbles, 10 percent stones; neutral (pH 6.8); clear wavy boundary. (2 to 6 inches thick)

2Bt—10 to 21 inches; yellowish brown (10YR 5/4) extremely cobbly clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate medium angular blocky; hard, friable, very sticky and very plastic; common very fine, fine, and medium roots; common very fine tubular pores; common moderately thick clay films in pores and on faces of peds; 25 percent pebbles, 30 percent cobbles, 10 percent stones; neutral (pH 7.2); clear wavy boundary. (5 to 11 inches thick)

2C1—21 to 46 inches; brown (10YR 5/3) extremely

cobbly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, sticky and plastic; common fine medium roots; common very fine interstitial pores; 30 percent pebbles, 35 percent cobbles, 10 percent stones; neutral (pH 7.3); gradual wavy boundary. (15 to 25 inches thick)

2C2—46 to 60 inches; brown (10YR 5/3) extremely cobbly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine interstitial pores; 30 percent pebbles, 35 percent cobbles, 10 percent stones; neutral (pH 7.3).

**Type location:** Lander County, Nevada, south part; about 40 miles northeast of Austin, approximately 1,400 feet east of the southwest corner of sec. 14, T. 20 N., R. 46 E. (part of the BLM contract completed in Lander County)

### **Range in Characteristics**

**Soil moisture:** Usually dry, moist from October through late June

**Soil temperature:** 42 to 45 degrees F

**Average summer soil temperature:** 57 to 59 degrees F

**Mollic epipedon thickness:** 7 to 10 inches, includes upper part of Bt horizon in some pedons

**Depth to base of Bt horizon:** 9 to 21 inches

**Depth to bedrock:** 40 to more than 60 inches

**Control section:** Clay content—18 to 30 percent, when averaged; texture—extremely cobbly clay loam, extremely cobbly sandy clay loam, or extremely cobbly loam; rock fragments—60 to 80 percent with 25 to 60 percent pebbles, 20 to 40 percent cobbles, and as much as 10 percent stones

**Reaction throughout the profile:** Nearly constant throughout the profile

**Other features:** Thin BA and BC horizons are common in some pedons

#### **A horizon:**

Chroma—2 or 3

Structure—weak or moderate, very fine to medium granular or subangular blocky

Consistence—soft or slightly hard dry, very friable or friable moist

#### **2Bt horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Structure—weak or moderate, very fine to medium angular or subangular blocky structure; massive in some pedons

Consistence—slightly hard or hard dry, slightly sticky to very sticky and slightly plastic to very plastic wet

**2C horizon:**

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 to 6

Texture—extremely cobbly loam, extremely cobbly fine sandy loam, extremely cobbly sandy loam, or extremely cobbly loamy sand

Rock fragments—25 to 50 percent pebbles, 20 to 35 percent cobbles, and as much as 10 percent stones

Consistence—soft to very hard dry, very friable or friable moist, slightly sticky or sticky and nonplastic to plastic wet

**Paranat Series**

The Paranat series consists of very deep, poorly drained soils that formed in silty fluvial deposits. Paranat soils are on flood plains. In some areas stream channel entrenchment or channel realignment has altered drainage. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Fluvaquentic Haplaquolls

**Typical pedon:** Paranat silty clay loam:

- A1—0 to 2 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; strong fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; many very fine and fine random roots; many very fine vesicular, interstitial, and tubular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 5 inches thick)
- A2—2 to 7 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; strong very fine and fine angular blocky structure; slightly hard, very friable, sticky and very plastic; many very fine and fine random and few medium oblique roots; few very fine tubular and common very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 9 inches thick)
- A3—7 to 20 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, sticky and plastic; common very fine and fine random and few medium oblique roots; many micro and very fine tubular and interstitial pores; slightly effervescent; moderately alkaline (pH 8.2); clear irregular boundary. (0 to 13 inches thick)
- AC—20 to 31 inches; gray (10YR 6/1) silty clay loam, very dark gray (10YR 3/1) moist; common fine

distinct brown (7.5YR 4/4 moist) and dark brown (7.5YR 3/2 moist) mottles; weak medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable, sticky and very plastic; common very fine and fine random and few medium oblique roots; many very fine tubular and few fine tubular and interstitial pores; common thin silt coatings lining pores; few fine and medium violently effervescent segregated lime filaments or threads; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 15 inches thick)

- C1—31 to 36 inches; gray (10YR 6/1) silty clay loam, dark grayish brown (2.5Y 4/2) moist; common fine distinct brown (7.5YR 4/4 moist) and dark brown (7.5YR 3/2 moist) mottles; massive; slightly hard, very friable, sticky and plastic; common very fine and fine random and weak medium oblique roots; very fine and fine tubular and few fine interstitial pores; many thin and moderately thick silt coatings lining pores; few fine segregated white (10YR 8/2) lime filaments or threads, light gray (10YR 7/2 moist); few snail shells; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 15 inches thick)

- C2—36 to 48 inches; light gray (10YR 7/1) silt loam, grayish brown (2.5Y 5/2) moist; common fine distinct brown (7.5YR 4/4 moist) and dark brown (7.5YR 3/2 moist) mottles; massive; slightly hard, very friable, slightly sticky and plastic; common very fine random and few fine oblique roots; many very fine tubular and few fine interstitial pores; common thin silt coatings lining pores; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (9 to 15 inches thick)

- Ck—48 to 60 inches; light gray (10YR 7/2) very fine sandy loam, grayish brown (10YR 5/2) moist; common fine distinct brown (7.5YR 4/4 moist) and dark brown (7.5YR 3/2 moist) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine random and few fine oblique roots; common very fine tubular and few fine interstitial pores; about 10 percent medium irregular shaped segregated lime concretions; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 1.6 miles northwest of Battle Mountain, approximately 200 feet south and 500 feet east of the northwest corner of sec. 8, T. 32 N., R. 45 E.

**Range in Characteristics**

**Soil moisture:** Dry in midsummer and early fall, moist in late fall, winter, spring, and early summer; apparent seasonal high water table at a depth of 18 to 40



inches in winter to early summer; drained phases recognized

*Soil temperature:* 47 to 52 degrees F

*Thickness of mollic epipedon:* 10 to 20 inches

*Control section:* Texture—silty clay loam and silt loam with thin strata of very fine sandy loam or silty clay in some pedons; clay content—18 to 35 percent; rock fragments—less than 5 percent

*Calcium carbonate equivalent:* 1 to 10 percent

*Effervescence:* Effervescent throughout

*Reaction throughout the profile:* Moderately alkaline to strongly alkaline, usually becoming less alkaline with depth

*Exchangeable sodium:* 0 to 15 percent

*A horizon:*

Hue—10YR or 2.5Y

Value—4 or 5 dry, 2 or 3 moist

Chroma—1 or 2

Structure—prismatic, blocky, platy, or granular

Other features—one or more buried A horizons as much as 8 inches thick in some pedons

*C horizon:*

Hue—10YR or 2.5Y

Value—6, 7, or 8 dry, 4, 5, 6, or 7 moist

Chroma—1, 2, 3, or 4

Carbonates—as much as 15 percent lime filaments, soft masses, or concretions in some pedons, as much as 40 percent in some subhorizons below a depth of 40 inches

Consistence—soft or slightly hard dry, very friable or friable moist

## Perlor Series

The Perl series consists of shallow, well drained soils that formed in loess capped residuum of soft, tuffaceous sedimentary rocks. Perl soils are on crests and side slopes of rolling hills. Slopes are 4 to 15 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents

**Typical pedon:** Perl very fine sandy loam, 4 to 15 percent slopes, in an area of the Genaw-Perl-Puett association. Pebbles cover 10 percent of the soil surface:

A1—0 to 3 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine vesicular pores; 5 percent pebbles; moderately alkaline (pH

8.4); clear smooth boundary. (2 to 4 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; common very fine interstitial pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (3 to 5 inches thick)

2C1—7 to 12 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine interstitial pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.5); clear smooth boundary. (4 to 7 inches thick)

2C2—12 to 14 inches; very pale brown (10YR 7/3) gravelly sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common fine interstitial pores; 30 percent pebbles; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 4 inches thick)

2Cr—14 inches; fractured, soft, sedimentary tuff; few very fine roots along fractures.

**Type location:** Lander County, Nevada; about 30 miles southwest of Battle Mountain in the Fish Creek Basin area, approximately 1,375 feet north and 1,450 feet west of the southeast corner of sec. 11, T. 27 N., R. 41 E.

## Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and early spring

*Soil temperature:* 47 to 52 degrees F

*Depth to paralithic contact:* 10 to 14 inches

*Control section:* Clay content—averages 10 to 18 percent; rock fragments—average 5 to 20 percent pebbles with as much as 30 percent in any one subhorizon; as much as 20 percent may be comprised of soft platy pebbles

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline, usually becoming more alkaline with depth

*A horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—subangular blocky or platy; massive in some pedons

Effervescence—dominantly noneffervescent or slightly effervescent but ranges to strongly effervescent in some pedons

*C horizon:*

Value—6 or 7 dry, 4, 5, or 6 moist  
 Chroma—2 or 3  
 Texture—loam, sandy loam, or gravelly sandy loam  
 Structure—subangular blocky; massive in some pedons  
 Effervescence—slightly effervescent to violently effervescent

**Pernty Series**

The Pernty series consists of shallow, well drained soils that formed in residuum and some colluvium of quartzite and chert. Pernty soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Argixerolls

**Typical pedon:** Pernty very gravelly sandy loam, 30 to 50 percent slopes, in an area of the Sumine-Winada Variant-Pernty association. Pebbles cover 25 percent of the soil surface:

- A—0 to 3 inches; brown (10YR 5/3) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores; 40 percent pebbles; neutral (pH 6.8); abrupt wavy boundary. (2 to 5 inches thick)
- Bt1—3 to 8 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine, common medium, and few coarse roots; common very fine tubular and few very fine interstitial pores; few thin clay films on faces of peds; 40 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (4 to 6 inches thick)
- Bt2—8 to 14 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common very fine, fine, and medium and few coarse roots; common very fine tubular and few very fine interstitial pores; common thin clay films on faces of peds and lining pores; 40 percent pebbles, 15 percent cobbles; neutral (pH 7.0); abrupt smooth boundary. (4 to 10 inches thick)
- 2R—14 inches; chert.

**Type location:** Lander County, Nevada; about 18 miles south of Battle Mountain, approximately 525 feet

north and 2,400 feet west of the southeast corner of sec. 10, T. 29 N., R. 45 E.

**Range in Characteristics**

- Soil moisture:* Usually dry, moist in part from late October through early June
- Soil temperature:* 42 to 47 degrees
- Average summer soil temperature:* 59 to 64 degrees F
- Mollic epipedon thickness:* 7 to 10 inches, includes the upper part of the Bt horizon
- Depth to base of Bt horizon:* 14 to 20 inches
- Depth to lithic contact:* 14 to 20 inches
- Control section:* Clay content—25 to 35 percent when mixed; rock fragments—35 to 50 percent when mixed, mainly pebbles or cobbles
- A horizon:*
  - Chroma—2 or 3
  - Structure—weak or moderate granular or subangular blocky
- Bt horizon:*
  - Value—5 or 6 dry, 3 or 4 moist
  - Chroma—3 or 4
  - Texture—very gravelly clay loam, very gravelly loam, or very cobbly clay loam
  - Structure—weak or moderate subangular blocky; massive in some pedons

**Perwick Series**

The Perwick series consists of moderately deep, well drained soils that formed in residuum of tuffaceous sediments, consolidated lake sediments, and siltstone. Perwick soils are on dissected, low hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Xeric Torriorthents

**Typical pedon:** Perwick very gravelly loam, 30 to 50 percent slopes, in an area of the Colbar-Perwick-Settlemyer association. Pebbles cover 20 percent and cobbles 15 percent of the soil surface:

- A1—0 to 6 inches; pale brown (10YR 6/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 30 percent pebbles, 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 9 inches thick)
- A2—6 to 9 inches; pale brown (10YR 6/3) gravelly sandy loam, dark brown (10YR 4/3) moist;

moderate fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine, fine, and medium and common coarse roots; many very fine interstitial pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 8 inches thick)

C1—9 to 12 inches; very pale brown (10YR 7/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium and coarse roots; common very fine and fine interstitial pores; 30 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (3 to 13 inches thick)

C2—12 to 27 inches; light gray (2.5Y 7/2) gravelly sandy loam, light olive brown (2.5Y 5/4) moist; many coarse pale yellow (2.5Y 7/4) and light yellowish brown (10YR 6/4) variegations, light olive brown (2.5Y 5/4) and olive brown (2.5Y 4/4) moist; massive; very hard, very firm, slightly sticky and slightly plastic; few medium and coarse roots; few very fine tubular pores; 25 percent pebbles, 5 percent cobbles; common medium lime filaments and soft masses; violently effervescent; very strongly alkaline (pH 9.6); gradual wavy boundary. (8 to 20 inches thick)

Cr—27 to 48 inches; fractured tuffaceous sediments.

**Type location:** Lander County, Nevada; about 35 miles southwest of Battle Mountain, approximately 1,000 feet west and 1,000 feet north of the southeast corner of sec. 8, T. 27 N., R. 41 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from June through October

**Soil temperature:** 48 to 52 degrees F

**Depth to paralithic contact:** 20 to 40 inches

**Control section:** Rock fragments—10 to 35 percent, mainly pebbles

**Reaction throughout the profile:** Moderately alkaline to very strongly alkaline

**Effervescence:** Strongly effervescent to violently effervescent

#### A horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

#### C horizon:

Hue—10YR, 2.5Y, or 5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture—Sandy loam, fine sandy loam, silt loam, or

loam modified by 10 to 35 percent rock fragments

### Pineval Series

The Pineval series consists of very deep, well drained soils that formed in mixed gravelly alluvium. Pineval soils are on fan piedmonts and fan aprons. Slopes are 2 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Pineval gravelly loam, 2 to 4 percent slopes, in Lander County, south part. Pebbles cover 60 percent and cobbles 10 percent of the soil surface:

A—0 to 5 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate thick platy structure; slightly hard, friable, slightly sticky and nonplastic; few fine roots; common very fine and fine vesicular pores; 25 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); abrupt wavy boundary. (2 to 5 inches thick)

Bt1—5 to 8 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine interstitial pores; few thin clay skins on faces of peds; 35 percent pebbles, 15 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (3 to 6 inches thick)

Bt2—8 to 11 inches; pale brown (10YR 6/3) very gravelly clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and common fine and medium roots; common very fine interstitial pores; common thin and few moderately thick clay films on faces of peds; 10 percent 5- to 15-millimeter, weak durinodes; 35 percent pebbles, 15 percent cobbles; few fine lime filaments; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 7 inches thick)

Bqk1—11 to 24 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial pores; 50 percent weak discontinuous silica cementation; 55 percent pebbles, 15 percent cobbles; many lime particles; violently effervescent; moderately alkaline (pH 8.4);

gradual wavy boundary. (8 to 20 inches thick)  
**Bqk2**—24 to 33 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, dark brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; 40 percent weak continuous silica cementation; 55 percent pebbles, 15 percent cobbles; common thin lime coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.4); gradual wavy boundary. (0 to 12 inches thick)

**Bk**—33 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, dark brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine roots; many fine interstitial pores; 60 percent pebbles, 10 percent cobbles; common thin lime coatings on undersides of rock fragments; slightly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada, south part; about 15 miles northeast of Austin, approximately 650 feet south and 2,100 feet west of the northeast corner of sec. 17, T. 21 N., R. 46 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-June through October

**Soil temperature:** 47 to 52 degrees F

**Reaction throughout the profile:** Mildly alkaline or moderately alkaline

#### A horizon:

Hue—10YR or 2.5Y

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

#### Bt horizon:

Value—5 or 6 dry

Chroma—3 or 4

Texture—very gravelly loam, very gravelly clay loam, or very gravelly sandy clay loam

Clay content—25 to 35 percent

Rock fragments—35 to 60 percent, mostly pebbles

#### Bqk horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—very gravelly sandy loam to extremely gravelly sand

Rock fragments—35 to 70 percent, mostly pebbles

but mainly in silty alluvium of mixed rock sources. Prida soils are on alluvial flats. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aquic Durorthidic Torriorthents

**Typical pedon:** Prida silt loam. The soil surface is covered with a crust:

**A**—0 to 5 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; strong very thin, thin, and medium platy structure; slightly hard, very friable, slightly sticky and plastic; common very fine random and few fine and medium vertical and horizontal roots; many very fine vesicular, interstitial, and tubular pores; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (3 to 9 inches thick)

**Czy**—5 to 7 inches; very pale brown (10YR 8/3) loamy sand, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; very few very fine to medium random roots; many very fine vesicular, interstitial, and tubular pores; a horizontal lens of hard, firm, 1/2- to 2-inch-thick layer of salt crystals; common fine gypsum filaments; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (2 to 10 inches thick)

**Cy**—7 to 23 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, sticky and plastic; many very fine random and few fine and medium vertical and oblique roots; common very fine tubular pores; about 5 percent weak, 4- to 20-millimeter durinodes; few fine gypsum filaments and threads; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (6 to 21 inches thick)

**Cqy**—23 to 38 inches; light gray (10YR 7/2) silt loam, yellowish brown (10YR 5/4) moist; common medium distinct yellowish brown (10YR 5/4) mottles, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and plastic; few very fine and fine random roots; many very fine and fine tubular pores; about 25 percent weak and moderately strong, 15- to 30-millimeter durinodes; common fine gypsum concretions; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (6 to 15 inches thick)

**Cqk1**—38 to 47 inches; white (10YR 8/2) silt loam, yellowish brown (10YR 5/4) moist; common medium distinct light brown (7.5YR 6/4) mottles, brown (7.5YR 4/4) moist; weak thin platy structure; hard, very friable, sticky and plastic; very few very fine and fine random roots; many very fine and few fine tubular pores; common thin reoriented silt coatings

### Prida Series

The Prida series consists of very deep, somewhat poorly drained soils that formed in some volcanic ash

lining pores; 25 percent discontinuous very weakly silica-cemented masses; 10 percent 5- to 20-millimeter, weak durinodes; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (6 to 15 inches thick)

**Cqk2**—47 to 57 inches; light gray (10YR 7/1) and white (10YR 8/2) silt loam, yellowish brown (10YR 5/4) moist; many fine distinct dark brown (7.5YR 3/2 moist) mottles; massive; hard, friable, sticky and plastic; very few very fine random roots; many very fine and very few fine tubular pores; 25 percent discontinuous weakly silica- and lime-cemented masses; 20 percent weak and moderately strong, 5- to 15-millimeter durinodes; violently effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (0 to 12 inches thick)

**Cq**—57 to 62 inches; light gray (10YR 7/1) and white (10YR 8/1) silt loam, pale brown (10YR 6/3) moist; many fine distinct brown (7.5YR 5/4) mottles, dark brown (7.5YR 3/2, 4/2) moist; massive; hard, friable and firm, slightly sticky and slightly plastic; many very fine and very few fine tubular pores; weak and very weak continuous silica cementation; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 6 miles southeast of Battle Mountain, approximately 2,000 feet south and 45 feet west of the northeast corner of sec. 16, T. 31 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Saturated within a depth of 36 to 60 inches from winter through early summer in most years

**Soil temperature:** 47 to 52 degrees F

**Depth to a Cq horizon:** 15 to 38 inches

**Control section:** Clay content—20 to 35 percent when mixed; texture—silt loam or silty clay loam

**Salts:** Slightly to strongly salt affected; salt crystals in the upper subhorizons of some pedons

**Sodium:** ESP less than 15 percent in half or more of the uppermost 20 inches

**Other features:** Unconformable lacustrine material at a depth of 30 to 60 inches in some pedons; iron mottles below a depth of 15 inches in some pedons

#### A horizon:

Value—6 or 7 dry, 4 to 6 moist

Chroma—2 or 3

Consistence—nonsticky to sticky and nonplastic to very plastic wet

Reaction—Neutral to very strongly alkaline

Effervescence—noneffervescent to strongly effervescent

#### Czy horizon:

Value—6 to 8 dry, 4 to 6 moist

Reaction—mildly alkaline to strongly alkaline

Salt—0.5 to 2 percent soluble salts

#### Cy horizon:

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Reaction—Mildly alkaline to strongly alkaline

#### Cq horizon:

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—1 to 4

Cementation—20 to 50 percent weak discontinuous silica cementation, few to many silica films in pores and on peds in a firm matrix or 20 to 50 percent durinodes in a friable matrix; subhorizons below a depth of 40 inches in some pedons may be continuously weakly silica cemented

### Puett Series

The Puett series consists of shallow, well drained soils that formed in residuum of weathered tuff and tuffaceous sandstone. Puett soils are on low hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents

**Typical pedon:** Puett gravelly sandy loam, 15 to 30 percent slopes, very stony, in an area of the Bioya-Shabliss-Puett association. Pebbles cover 25 percent, cobbles 10 percent, and stones 2 percent of the soil surface:

**A**—0 to 4 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many fine tubular pores; 15 percent pebbles, 2 percent stones; lime coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 7 inches thick)

**C**—4 to 15 inches; pale brown (10YR 6/3) gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; common fine tubular pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (9 to 15 inches thick)

Cr—15 inches; highly weathered tuff.

**Type location:** Lander County, Nevada; about 22 miles northeast of Battle Mountain, approximately 100 feet south and 2,000 feet east of the northwest corner of sec. 1, T. 35 N., R. 47 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Depth to bedrock:* 10 to 20 inches

*Control section:* Clay content—5 to 10 percent; rock fragments—as much as 35 percent pebbles

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

*Carbonates:* Strongly or violently effervescent throughout; lime coatings on pebbles in lower part of some pedons

#### A horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—weak or moderate, thin to thick platy; massive in some pedons

#### C horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture of fine earth—loamy fine sand to loam but dominantly coarse sandy loam to loam; gravelly loam or gravelly sandy loam in some pedons

Structure—subangular blocky; massive in some pedons

### Pumper Series

The Pumper series consists of very deep, somewhat excessively drained soils that formed in some loamy loess high in content of volcanic ash but mainly in very gravelly or extremely gravelly sandy alluvium derived from mixed rock sources. Pumper soils are on fan skirts. Slopes are 0 to 2 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Camborthids

**Typical pedon:** Pumper silt loam:

A—0 to 6 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and plastic; common very fine random and few fine oblique roots; many very fine

and fine vesicular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (1 to 6 inches thick)

Bw—6 to 12 inches; light gray (10YR 7/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common very fine random, few fine oblique, and few medium horizontal roots; many very fine and few fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (6 to 18 inches thick)

2Bk1—12 to 17 inches; light gray (10YR 7/2) very gravelly loam, brown (10YR 5/3) moist; massive; hard, friable, sticky and plastic; many very fine random roots; few fine oblique and few medium vertical roots; many very fine tubular pores; 50 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (0 to 9 inches thick)

3Bk2—17 to 22 inches; pale brown (10YR 6/3) extremely gravelly coarse loamy sand, brown (10YR 4/3) moist; loose; nonsticky and nonplastic; many very fine random and very few fine oblique roots; 75 percent pebbles; few medium lime segregations in seams and coating pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 9 inches)

3Bk3—22 to 60 inches; variegated color extremely gravelly coarse sand; single grained; loose, nonsticky and nonplastic; many very fine random and very few fine oblique roots; 80 percent pebbles, 2 percent cobbles; common large lime segregations in seams or coating pebbles; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 38 miles northwest of Austin, approximately 1,420 feet east and 1,320 feet south of the northwest corner of sec. 16, T. 24 N., R. 41 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 53 degrees F

*Depth to 2Bk horizon:* 11 to 24 inches

*Control section:* Clay content—0 to 10 percent; texture—averages very gravelly sand or extremely gravelly sand; rock fragments—50 to 80 percent, mainly pebbles

#### A horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—weak or moderate, thin to thick platy; massive in some pedons

Consistence—soft or slightly hard

Reaction—mildly alkaline to strongly alkaline

Other features—slightly effervescent in some pedons because of recharge from dust

**Bw horizon:**

Hue—10YR or 2.5Y

Value—5 to 7 dry, 3 or 4 moist (5 dry and 3 moist from dark sand grains)

Chroma—2 or 3

Texture—commonly loam, but very fine sandy loam, silt loam, fine sandy loam, or sandy loam in some pedons

Structure—weak, medium or coarse subangular blocky or prismatic; massive in some pedons

Reaction—mildly alkaline to strongly alkaline

**2Bk and 3Bk horizons:**

Hue—10YR or 2.5Y

Value—4 to 8 dry, 3 to 6 moist

Chroma—1 to 3

Texture—very gravelly sand to extremely gravelly coarse sand

Reaction—moderately alkaline or strongly alkaline

Carbonates—very thin coatings on at least the underside of rock fragments, few or common soft lime masses in some pedons

## Punchbowl Series

The Punchbowl series consists of shallow, well drained soils formed mainly in residuum of andesite, dacite, rhyolite, and tuffs and in shale residuum. Punchbowl soils are on crests and side slopes of hills and mountains. Slopes are 4 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Loamy, mixed, frigid Lithic Xerollic Haplargids

**Typical pedon:** Punchbowl loam, 15 to 30 percent slopes, in an area of Punchbowl-Rock outcrop association, in Lander County, south part. Pebbles cover 25 percent and cobbles 5 percent of the soil surface:

A1—0 to 3 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, sticky and plastic; few very fine roots; many very fine vesicular pores; 10 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (2 to 5 inches thick)

A2—3 to 6 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure parting to moderate fine

subangular blocky; slightly hard, friable, very sticky and plastic; common very fine and fine and few medium roots; common very fine and fine interstitial pores; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (1 to 4 inches thick)

Bt—6 to 10 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, friable, very sticky and very plastic; common very fine and fine and few medium roots; common very fine tubular pores; common thin clay films on faces of peds and lining pores and few moderately thick clay films on faces of peds; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (3 to 7 inches thick)

R—10 inches; fractured andesite; soft lime in fractures.

**Type location:** Lander County, Nevada, south part; approximately 25 miles east of Austin, about 600 feet south and 600 feet east of northwest corner of sec. 4, T. 19 N., R. 47 E. (part of the BLM private contract completed in Lander County)

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-June through early November

**Soil temperature:** 45 to 47 degrees F

**Depth to bedrock:** 8 to 14 inches

**Control section:** Clay content—18 to 35 percent; rock fragments—15 to 35 percent

**Reaction throughout the profile:** Neutral to moderately alkaline, becoming more alkaline with depth

**A horizon:**

Value—4, 5, or 6 dry, 3 or 4 moist

Chroma—3 or 4

Carbonates—noneffervescent to strongly effervescent in the lower subhorizon

**Bt horizon:**

Hue—7.5YR or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly loam, gravelly sandy clay loam, or gravelly clay loam

Clay content—25 to 35 percent

Rock fragments—25 to 35 percent, mostly pebbles

Carbonates—noneffervescent to strongly effervescent matrix; very thin lime coatings on undersides of rock fragments or few soft lime segregations in lower part of some pedons

Other features—few thin patchy colloid coatings on rock fragments in some pedons

## Quarz Series

The Quarz series consists of moderately deep, well drained soils that formed in residuum and colluvium of sandstone and shale. Quarz soils are on side slopes of mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Quarz very gravelly loam, 30 to 50 percent slopes, in an area of Quarz-Linrose-Slaven association. Pebbles cover 15 percent of the soil surface:

A1—0 to 2 inches; brown (10YR 5/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine vesicular and few very fine tubular pores; 30 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (2 to 8 inches thick)

A2—2 to 9 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular and few very fine interstitial pores; 35 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 8 inches thick)

Bt1—9 to 13 inches; brown (7.5YR 4/4) very gravelly clay, brown (7.5YR 4/4) moist; strong fine and medium prismatic structure; hard, firm, sticky and plastic; common very fine roots; common very fine tubular pores; 35 percent pebbles, 5 percent cobbles; many thick clay films on faces of peds and lining pores; mildly alkaline (pH 7.8); abrupt wavy boundary. (4 to 10 inches thick)

Bt2—13 to 26 inches; brown (7.5YR 5/4) very gravelly clay, brown (7.5YR 4/4) moist; strong medium and coarse prismatic structure; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; 50 percent pebbles, 5 percent cobbles; continuous thick clay films on faces of peds and lining pores; mildly alkaline (pH 7.6); abrupt smooth boundary. (5 to 15 inches thick)

2R—26 inches; hard fractured shale.

**Type location:** Lander County, Nevada; about 18 miles southeast of Battle Mountain, approximately 2,500 feet north and 1,600 feet west of the southeast corner of sec. 6, T. 29 N., R. 47 E.

## Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from late July through October

**Soil temperature:** 44 to 47 degrees F

**Depth to bedrock:** 20 to 40 inches

**Thickness of mollic epipedon:** 7 to 16 inches, which includes the upper part of the argillic horizon in some pedons

**Control section:** Clay content—35 to 55 percent; rock fragments—35 to 60 percent, mainly pebbles and as much as 15 percent cobbles or stones

**Reaction throughout the profile:** Neutral or mildly alkaline

**A horizon:**

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—platy, granular, or weak subangular blocky

**Bt horizon:**

Hue—5YR, 7.5YR, or 10YR

Value—4 to 6 dry, 3 or 4 moist

Chroma—3 to 5

Texture—dominantly very gravelly clay loam or very gravelly clay; very cobbly clay loam or extremely gravelly clay in some subhorizons

Structure—subangular blocky, angular blocky or prismatic

## Raglan Series

The Raglan series consists of very deep, well drained soils that formed in some loess and volcanic ash but mainly in loamy, mixed alluvium and lacustrine materials derived from mixed rock sources. Raglan soils are on fan skirts. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Camborthids

**Typical pedon:** Raglan silt loam, gravelly substratum:

A1—0 to 5 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; strong very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine random and very few medium oblique roots; many very fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (1 to 5 inches thick)

A2—5 to 8 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; strong thin platy structure; slightly hard, very friable, slightly sticky and plastic; common very fine random and very few fine oblique



roots; many very fine interstitial and few very fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 5 inches thick)

**Bw**—8 to 15 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; strong thin and medium platy structure; slightly hard, friable, slightly sticky and plastic; common very fine random and few fine oblique and horizontal roots; many very fine tubular and interstitial pores; very slightly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (6 to 10 inches thick)

**Bqk1**—15 to 20 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; white (10YR 8/1) lime coatings on faces of peds, white (10YR 8/2) moist; moderate thin platy structure; hard, friable, slightly sticky and plastic; few very fine random expd roots; many very fine tubular and common very fine interstitial pores; silica cementation bridging sand grains; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (5 to 25 inches thick)

**Bqk2**—20 to 29 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; few fine distinct brown (7.5YR 5/4) mottles, dark brown (7.5YR 4/2) moist; massive; hard, friable, slightly sticky and plastic; common very fine random roots; many very fine tubular pores; 25 percent 10- to 25-millimeter, hard, firm, brittle durinodes; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 20 inches thick)

**Bqk3**—29 to 37 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; few fine distinct brown (7.5YR 5/4) mottles, brown (7.5YR 4/4) moist; very pale brown (10YR 8/3) lime coatings on faces of peds, very pale brown (10YR 7/4) moist; weak thin and medium platy structure; hard, friable, slightly sticky and plastic; very few very fine random and oblique roots; common very fine tubular and few very fine interstitial pores; 5 percent small pebbles; silica cementation bridging sand grains; about 25 percent 10- to 25-millimeter, hard, firm, brittle durinodes; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 10 inches thick)

**Bqk4**—37 to 47 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 4/3) moist; common fine distinct light brown (7.5YR 6/4) mottles, brown (7.5YR 5/4) moist; massive; hard, friable, nonsticky and slightly plastic; very few very fine random roots; many very fine tubular pores; 5 percent small pebbles; silica cementation bridging

sand grains; about 25 percent 10- to 25-millimeter, hard, firm, brittle durinodes; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 12 inches thick)

**2C**—47 to 60 inches; light gray (10YR 7/2) gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; massive; loose, nonsticky and nonplastic; few very fine random roots; about 30 percent fine and medium sized pebbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 1.7 miles southwest of Battle Mountain, at a site approximately 2,100 feet south and 2,100 feet west of the northeast corner of sec. 30, T. 32 N., R. 45 E.

### Range in Characteristics

**Soil moisture:** Usually dry, intermittently moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to Bqk horizon:** 10 to 20 inches

**Control section:** Clay content—18 to 25 percent; texture—loam, silt loam, very fine sandy loam, clay loam, and silty clay loam, averages silt loam that is 15 percent sand coarser than very fine sand

**Profile color:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

**Reaction throughout the profile:** Mildly alkaline to very strongly alkaline, generally becoming more alkaline with depth

**Salt and sodium:** Normally nonsaline-sodic to slightly saline-sodic to a depth of 10 to 20 inches and slightly to strongly saline-sodic below; moderately or strongly saline-sodic phases are recognized

**Other features:** Mineralogy is mixed but includes a strong influence of volcanic ash

**A horizon:**

Structure—weak to strong very thin to thick platy; massive in some pedons

Consistence—soft or slightly hard dry

Effervescence—noneffervescent to strongly effervescent

**Bw horizon:**

Structure—thin to thick platy; prismatic; subangular blocky; massive in some pedons

Effervescence—noneffervescent to strongly effervescent

**Bqk horizon:**

Durinodes—20 to 80 percent; up to 40 percent weak discontinuous silica cementation common

in any subhorizon where durinodes are present;  
hard or very hard dry, firm or very firm moist,  
and brittle

Consistence—matrix is soft to hard dry, very friable  
or friable moist

**2Bk and 3C horizons (where present):**

Hue—2.5Y or 5Y

Structure—platy; massive in some pedons

Effervescence—strongly effervescent or violently  
effervescent

Other features—lacustrine material that has hue of  
2.5Y or 5Y, relict mottles that are reddish in hue  
(7.5YR or 5YR), and high chroma (4 to 6) iron  
stains below a depth of 24 inches in some  
pedons; unrelated, very hard basaltic dikes  
below a depth of 36 inches in a few pedons

## Rasille Series

The Rasille series consists of very deep, well drained  
soils that formed in silty alluvium derived from loess and  
mixed rock sources. Rasille soils are on inset fans.

Slopes are 0 to 2 percent. Mean annual precipitation is  
about 8 inches, and mean annual temperature is about  
46 degrees F.

**Taxonomic class:** Coarse-silty, mixed, mesic  
Durixerollic Camborthids

**Typical pedon:** Rasille silt loam, 0 to 2 percent slopes,  
in an area of the McConnel-Rasille-Wholan  
association, in Lander County, south part:

A1—0 to 2 inches; pale brown (10YR 6/3) silt loam,  
dark brown (10YR 3/3) moist; moderate medium  
platy structure; slightly hard, very friable, slightly  
sticky and slightly plastic; few very fine roots; many  
very fine vesicular pores; mildly alkaline (pH 7.6);  
abrupt smooth boundary. (2 to 5 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) silt loam,  
dark brown (10YR 3/3) moist; moderate medium  
subangular blocky structure; soft, very friable,  
slightly sticky and slightly plastic; common very fine  
and fine roots; many very fine tubular pores; mildly  
alkaline (pH 7.6); clear smooth boundary. (0 to 5  
inches thick)

Bw—6 to 15 inches; pale brown (10YR 6/3) silt loam,  
dark brown (10YR 4/3) moist; moderate medium  
prismatic structure; slightly hard, very friable,  
slightly sticky and nonplastic; common very fine and  
fine and few medium roots; common very fine  
tubular and interstitial pores; mildly alkaline (pH  
7.8); clear wavy boundary. (6 to 20 inches thick)

Bq—15 to 24 inches; light yellowish brown (10YR 6/4)

silt loam, dark yellowish brown (10YR 4/4) moist;  
moderate medium subangular blocky structure;  
slightly hard, very friable, slightly sticky and  
nonplastic; common very fine and fine roots;  
common very fine tubular pores; 20 percent 5- to  
15-millimeter, weakly cemented durinodes;  
moderately alkaline (pH 8.2); clear wavy boundary.  
(0 to 9 inches thick)

Bqk1—24 to 33 inches; light yellowish brown (10YR  
6/4) silt loam, dark yellowish brown (10YR 4/4)  
moist; massive; slightly hard, friable, slightly sticky  
and slightly plastic; common very fine and fine  
roots; common very fine tubular pores; 40 percent  
5- to 15-millimeter, strongly cemented durinodes;  
common fine lime filaments and threads; slightly  
effervescent; moderately alkaline (pH 8.4); gradual  
wavy boundary. (7 to 13 inches thick)

Bqk2—33 to 60 inches; very pale brown (10YR 7/3)  
very fine sandy loam, dark yellowish brown (10YR  
4/4) moist; massive; soft, very friable, nonsticky and  
nonplastic; few very fine and fine roots; few very  
fine tubular pores; 25 percent 10- to 25-millimeter,  
weakly cemented durinodes; few fine lime filaments  
and threads; slightly effervescent; strongly alkaline  
(pH 8.6).

**Type location:** Lander County, Nevada, south part;  
approximately 22 miles east of Austin, about 1,000  
feet south and 1,000 feet east of the apparent  
southwest corner of sec. 2, T. 19 N., R. 40 E. (part  
of the BLM private contract completed in Lander  
County)

### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to carbonates:** 12 to 24 inches

**Depth to Bq or Bqk horizon:** 12 to 24 inches, consists of  
20 to 50 percent durinodes in a friable matrix

**Control section:** Texture—silt loam or very fine sandy  
loam that is less than 15 percent fine sand or  
coarser; clay content—10 to 18 percent

**Other features:** Gravelly substrata below a depth of 40  
inches in some pedons

#### A horizon:

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Reaction—neutral or mildly alkaline

#### Bw horizon:

Chroma—3 or 4

Reaction—mildly alkaline or moderately alkaline

#### Bqk horizon:

Value—6, 7, or 8 dry, 4, 5, or 6 moist

Chroma—2, 3, or 4

Reaction—moderately alkaline to very strongly alkaline

### **Redflame Series**

The Redflame series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. Redflame soils are on fan aprons. Slopes are 4 to 15 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Duric Haplargids

**Typical pedon:** Redflame very gravelly loam, 4 to 15 percent slopes, in an area of the Redflame-Kingingham association. Pebbles cover 60 percent and cobbles 5 percent of the soil surface:

A1—0 to 2 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; strong thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine vesicular pores; 40 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 4 inches thick)

A2—2 to 5 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine vesicular and tubular pores; 25 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 3 inches thick)

2Bt—5 to 14 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular and interstitial pores; common moderately thick clay films on faces of peds and lining pores; 35 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (6 to 12 inches thick)

3Bqk—14 to 31 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular and interstitial pores; 45 percent weak discontinuous silica cementation; 55 percent pebbles; common fine and medium lime seams and concretions; strongly effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (6 to 24 inches thick)

3C—31 to 36 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; single grained; loose, slightly sticky and slightly plastic; common very fine and fine roots; few very fine and fine tubular pores; 50 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 8 inches thick)

3Cq—36 to 42 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, dark yellowish brown (10YR 4/6) moist; single grained; loose, slightly sticky and slightly plastic; few very fine and fine roots; few very fine tubular pores; 20 percent 5- to 10-millimeter, strong durinodes; 55 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 11 inches thick)

3Ck—42 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; single grained; loose, slightly sticky and nonplastic; few very fine roots; few very fine tubular pores; 50 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0).

**Type location:** Lander County, Nevada; about 22 miles southeast of Battle Mountain, about 1,000 feet west and 450 feet north of the southeast corner of sec. 17, T. 28 N., R. 47 E.

### **Range in Characteristics**

**Soil moisture:** Usually dry, moist for short periods in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to Bqk horizon:** 10 to 16 inches

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

**2Bt horizon:**

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture: very gravelly loam or very gravelly clay loam

Clay content—20 to 30 percent

Rock fragments—35 to 50 percent, mainly pebbles

**3Bqk and 3Cq horizons:**

Value—5, 6, or 7 dry, 4 or 5 moist

Chroma—3, 4, or 6

Cementation: 20 to 60 percent weak discontinuous silica cementation or strongly cemented durinodes

**3C and 3Ck horizons:**

Value—5, 6, or 7 dry, 4 or 5 moist

Chroma—3, 4, or 6

## Rednik Series

The Rednik series consists of very deep, well drained soils that formed in mixed alluvium. Rednik soils are on fan piedmonts. Slopes are 4 to 15 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Haplargids

**Typical pedon:** Rednik very gravelly sandy loam, 8 to 15 percent slopes, in an area of the Oxcorel-Rednik-Veta association:

- A1—0 to 2 inch; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate medium and thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few medium roots; many very fine and fine vesicular pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0.5 inch to 4 inches thick)
- A2—2 to 5 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; moderate thin and medium platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few medium roots; many very fine vesicular and common fine tubular pores; 35 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 8 inches thick)
- Bt1—5 to 11 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; strong fine and medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; many very fine and fine tubular pores; few thin clay films on faces of peds; 40 percent pebbles with thin (less than 1 millimeter) lime coatings on undersides; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (5 to 22 inches thick)
- Bt2—11 to 16 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; strong fine and medium subangular blocky structure; hard, friable, sticky and plastic; many very fine roots; many very fine and fine tubular pores; few thin clay films on faces of peds; 40 percent pebbles with thin lime coatings on undersides; violently effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 10 inches thick)
- 2Bk1—16 to 25 inches; very pale brown (10YR 7/3) very gravelly fine sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and

slightly plastic; many very fine and few fine roots; many very fine interstitial pores; 40 percent pebbles with thin lime coatings on undersides; violently effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (2 to 10 inches thick)

2Bk2—25 to 36 inches; very pale brown (10YR 7/3) very gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine interstitial pores; 50 percent pebbles with thin (less than 1 millimeter) lime coatings on undersides; violently effervescent; very strongly alkaline (pH 9.4); gradual smooth boundary. (6 to 12 inches thick)

3Bk3—36 to 47 inches; very pale brown (10YR 7/3) very gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine interstitial pores; 55 percent pebbles; thin lime coatings on undersides of rock fragments; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (7 to 20 inches thick)

3Bk4—47 to 60 inches; very pale brown (10YR 7/4) extremely gravelly loamy sand, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine interstitial pores; 50 percent pebbles, 10 percent cobbles; thin lime coatings on undersides of rock fragments; violently effervescent; moderately alkaline (pH 8.0).

**Type location:** Lander County, Nevada; approximately 20 miles southeast of Battle Mountain, about 1,000 feet north and 1,000 feet west of the southeast corner of sec. 10, T. 29 N., R. 47 E.

### Range in Characteristics

**Soil moisture:** Usually dry, moist for short periods from November through early May

**Soil temperature:** 47 to 54 degrees F

**Thickness of A and Bt1 horizons:** 15 to 30 inches

**Control section:** Clay content—18 to 27 percent when mixed; rock fragments—35 to 75 percent, mainly pebbles

#### A horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

Structure—weak or moderate, thin to thick platy; fine to coarse subangular blocky

Consistence—soft or slightly hard dry

Reaction—mildly alkaline to strongly alkaline

#### Bt1 horizon:

Value—5 or 6 dry, 4 or 5 moist

Texture—very gravelly sandy clay loam, very gravelly sandy loam, extremely gravelly loam, or very gravelly loam

Structure—moderate or strong, medium or fine angular or subangular blocky; massive in some pedons

Reaction—moderately alkaline or strongly alkaline

Exchangeable sodium—15 to 30 percent in some part

Effervescence—strong or violent

**2Bk and 3Bk horizons:**

Hue—10YR or 7.5YR

Value—6, 7, or 8 dry, 4, 5, or 6 moist

Chroma—2, 3, or 4

Texture—very gravelly fine sandy loam, very gravelly sandy loam, extremely gravelly loamy sand, or very gravelly sand

Rock fragments—35 to 75 percent, mainly pebbles

Reaction—strongly alkaline or very strongly alkaline

Effervescence—strong or violent

## Reese Series

The Reese series consists of very deep, poorly drained soils that formed in loamy alluvium derived from mixed sediments that are of mostly volcanic origin and that contain high amounts of pyroclastic materials.

Reese soils are on alluvial flats and flood plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-loamy, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Reese silt loam:

A1—0 to 5 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and plastic; few very fine roots; many very fine vesicular and tubular pores; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (4 to 7 inches thick)

A2—5 to 9 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; strong coarse prismatic structure; slightly hard, friable, slightly sticky and plastic; common very fine and few fine, medium, and coarse roots; many very fine vesicular and tubular pores; strongly effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (4 to 13 inches thick)

C—9 to 19 inches; variegated light gray (10YR 7/2), pale brown (10YR 6/3), and yellowish brown (10YR 5/4) silty clay loam, variegated brown (10YR 4/3)

and dark brown (10YR 3/3) moist; weak very fine and fine angular blocky structure; hard, friable, sticky and plastic; many very fine and few fine, medium, and coarse roots; many very fine interstitial and tubular pores; violently effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (3 to 10 inches thick)

Cq—19 to 27 inches; variegated pale brown (10YR 6/3) and light gray (10YR 6/1) silty clay loam, variegated brown (10YR 4/3) and very dark gray (10YR 3/1) moist; common fine distinct strong brown (10YR 5/6 moist) and brown (7.5YR 4/4 moist) mottles; weak very fine and fine angular blocky structure; hard, friable, sticky and very plastic; few very fine, fine, and medium roots; common very fine tubular pores; continuous thin silica films on peds and many moderately thick silica films lining pores; 45 percent 5- to 20 millimeter, moderately strong durinodes; slightly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (0 to 8 inches thick)

Cqk1—27 to 49 inches; light gray (10YR 6/1) silty clay loam, variegated dark grayish brown (10YR 4/2) and very dark gray (10YR 3/1) moist; common fine distinct brownish yellow (10YR 6/6 moist) and yellowish brown (10YR 5/6 moist) mottles; weak thick platy structure; very hard, firm and very firm, brittle; few very fine and fine roots; many very fine tubular pores; continuous thin silica coatings in pores; weak continuous silica cementation; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (6 to 22 inches thick)

Cqk2—49 to 60 inches; light gray (10YR 7/1) silty clay loam, variegated grayish brown (10YR 5/2) and dark gray (5Y 4/1) moist; common fine distinct yellowish brown (10YR 5/4 moist) and brown (7.5YR 4/4 moist) mottles; massive; hard, firm, very sticky and very plastic; many very fine and fine tubular pores; 40 percent 5- to 15-millimeter, moderately strong durinodes; 20 percent weak discontinuous silica cementation; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; approximately 3.7 miles south of Battle Mountain, about 1,750 feet west of the approximate southeast corner of sec. 5, T. 31 N., R. 45 E.

### Range in Characteristics

**Soil moisture:** Saturated at a depth of 18 to 36 inches for some period during most years

**Soil temperature:** 47 to 53 degrees F

**Depth to weak continuous silica cementation:** 15 to 30 inches

**Control section:** Clay content—18 to 30 percent when mixed; texture—averages loam, clay loam, or silty

clay loam; sand fraction—more than 15 percent fine sand and coarser particles; rock fragments—up to 5 percent pebbles below 25 inches in many pedons

*Profile reaction:* Strongly alkaline or very strongly alkaline

*Other features:* Buried A horizons below a depth of 20 inches in some pedons; 20 to 40 percent durinodes; secondary carbonate concretions below a depth of 20 inches in some pedons; unconformable stratified sand and gravel below a depth of 42 inches in some pedons

*A horizon:*

Hue—2.5Y or 10YR

Value—6 to 7 dry, 4 or 5 moist

Chroma—1 to 4

Consistence—slightly hard or hard dry, slightly sticky or sticky and plastic or very plastic wet

*C horizon:*

Hue—10YR, 2.5Y, or 5Y

Value—3 to 6 moist

Chroma—1 to 4

Texture—silt loam, silty clay loam, clay loam, and sandy clay loam; thin strata of coarse sandy clay loam in some pedons

Consistence—slightly hard or hard dry, very friable to firm moist, and slightly sticky to very sticky wet

Cementation—Cq horizons are continuously weakly silica cemented; subhorizons containing 20 to 50 percent durinodes or discontinuous cementation are common

## Reina Series

The Reina series consists of shallow, well drained soils that formed in residuum of some volcanic ash and loess but mainly of andesite, basalt, quartzite, and tuff. Reina soils are on side slopes of hills. Slopes are 4 to 30 percent. Precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic, shallow Xerollic Durargids

**Typical pedon:** Reina loam, 4 to 15 percent slopes, in an area of the Trunk-Reina association. Pebbles cover 15 percent of the soil surface:

A1—0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many fine vesicular pores; 10 percent pebbles;

moderately alkaline (pH 8.0); clear smooth boundary. (1 to 7 inches thick)

A2—2 to 7 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, friable, sticky and plastic; common very fine and fine and few medium roots; many very fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 6 inches thick)

Bt1—7 to 11 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; many very fine tubular pores; few thin clay films on peds; 25 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary. (0 to 6 inches thick)

Bt2—11 to 18 inches; yellowish brown (10YR 5/4) very gravelly clay, dark brown (7.5YR 4/4) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; very hard, firm, very sticky and very plastic; few fine roots; few fine tubular pores; continuous moderately thick clay films on peds; 45 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); abrupt wavy boundary. (3 to 10 inches thick)

Bqkm—18 to 26 inches; indurated duripan; massive; very hard, very firm; very thin continuous laminar cap; abrupt wavy boundary. (2 to 10 inches thick)

R—26 inches; andesite.

**Type location:** Lander County, Nevada; about 22 miles northeast of Battle Mountain, 900 feet north and 1,500 feet east of the southwest corner of sec. 35, T. 36 N., R. 46 E.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from July through October

*Soil temperature:* 47 to 52 degrees F

*Solum thickness and depth to duripan:* 14 to 20 inches

*Depth to bedrock:* 22 to 30 inches

*Control section:* Clay content—35 to 55 percent; rock fragments—35 to 60 percent, mainly pebbles, 5 to 15 percent cobbles

*A horizon:*

Value—3 or 4 moist

Reaction—mildly alkaline or moderately alkaline

*Bt2 horizon:*

Hue—7.5YR, 10YR

Value—4 or 5 dry

Chroma—4 or 5

Texture—averages very gravelly clay or very gravelly clay loam

*Bqkm horizon:*

Other features—indurated duripan overlying bedrock

**Relley Series**

The Relley series consists of very deep, well drained soils that formed in mixed silty alluvium of some loess and volcanic ash but mostly of volcanic rocks. Relley soils are on fan skirts and inset fans. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Duric Camborthids

**Typical pedon:** Relley silt loam:

Ap—0 to 4 inches; light gray (2.5Y 7/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak coarse and very coarse subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine roots; many very fine vesicular and tubular pores; slightly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (3 to 8 inches thick)

A—4 to 8 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderate coarse prismatic structure parting to moderate thin and medium platy; slightly hard, very friable, slightly sticky and plastic; common very fine and few fine and medium roots; many very fine vesicular, interstitial, and tubular pores; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 6 inches thick)

Bw—8 to 16 inches; very pale brown (10YR 7/3) silt loam, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and plastic; common very fine roots; many very fine and few fine tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 11 inches thick)

Bqk1—16 to 21 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and plastic; common very fine and few fine roots; common very fine tubular pores; 25 percent 5- to 40-millimeter, weakly and strongly silica-cemented durinodes; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (4 to 12 inches thick)

Bqk2—21 to 28 inches; very pale brown (10YR 8/3) silt loam, light yellowish brown (10YR 6/4) moist; weak and moderate thin platy structure; slightly hard, friable, slightly sticky and plastic; common very fine and few fine roots; common very fine tubular pores;

10 percent weak durinodes; 40 percent weak discontinuous silica cementation; violently effervescent; many medium white (10YR 8/1) and very pale brown (10Y 8/3 moist) secondary carbonate coatings on peds; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 19 inches thick)

Bk1—28 to 52 inches; very pale brown (10YR 7/3) silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; violently effervescent; common fine filaments or threads and small isolated pockets of secondary carbonates; moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 25 inches thick)

Bk2—52 to 63 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; common fine distinct brown (7.5YR 5/4 moist) and common fine faint dark brown (10YR 3/3 moist) mottles; massive; slightly hard, friable, slightly sticky and plastic; few very fine roots; many very fine tubular pores; violently effervescent; common fine filaments or threads of secondary carbonates; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; approximately 52 miles southwest of Battle Mountain, about 660 feet south and 530 feet east of the northwest corner of sec. 12, T. 24 N., R. 40 E.

**Range In Characteristics**

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 53 degrees F

*Control section:* Clay content—18 to 27 percent; depth to the Bqk horizon—11 to 25 inches

*Relict mottles:* Common faint or distinct relict mottles below a depth of 16 inches

*Salt and sodium:* Normally moderately or strongly salt and sodium affected below a depth of 30 inches

*Volcanic ash:* A layer of volcanic ash 4 to 8 inches thick common at a depth of 16 to 45 inches

*Other features:* Coarse sandy loam textures below a depth of 50 inches in some pedons

*A horizon:*

Hue—2.5Y or 10YR

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Consistence—slightly hard or hard, very friable or friable

Reaction—moderately or strongly alkaline

*Bw horizon:*

Value—6 or 7 dry

Chroma—2, 3, or 4 dry, 3 or 4 moist

Consistence—slightly hard or hard, very friable or friable

Reaction—moderately or strongly alkaline

*Bq, Bk, Bqk horizons:*

Value—5 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Texture—silt loam with strata of very fine sandy loam or silty clay loam in some pedons

Structure—platy; massive in some pedons

Reaction—moderately to very strongly alkaline

Carbonates—strongly or violently effervescent, except those in the Bq horizon, which are noneffervescent

Silica cementation—20 to 50 percent weak or strongly cemented durinodes; a 4- to 7-inch-thick horizon that is 30 to 50 percent discontinuous weakly silica cemented and is hard and brittle at a depth of 16 to 34 inches

Other features—a continuous weakly or strongly cemented hardpan below a depth of 50 inches in some pedons

### **Reluctan Series**

The Reluctan series consists of moderately deep, well drained soils that formed in residuum and colluvium weathered from rhyolite and other intrusive rocks. Reluctan soils are on side slopes of mountains. Slopes are 8 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Aridic Argixerolls

**Typical pedon:** Reluctan gravelly loam, 15 to 30 percent slopes, in an area of the Millerlux-Reluctan-Cleavage association. Pebbles cover 15 percent and cobbles 5 percent of the soil surface:

A1—0 to 2 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine vesicular pores; 15 percent pebbles; neutral (pH 7.2); clear smooth boundary. (2 to 5 inches thick)

A2—2 to 13 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (4 to 11 inches thick)

Bt1—13 to 23 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 3/4)

moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; common very fine tubular pores; few thin clay films on faces of peds and in pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 10 inches thick)

Bt2—23 to 38 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, sticky and plastic; few very fine roots; common very fine tubular pores; 30 percent pebbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (10 to 25 inches thick)

2R—38 inches; rhyolitic tuff.

**Type location:** Lander County, Nevada; near Maysville Summit, about 14 miles southeast of Battle Mountain, approximately 2,000 feet south and 500 feet west of the northeast corner of sec. 7, T. 29 N., R. 46 E.

### **Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry from July through October

**Soil temperature:** 44 to 47 degrees F

**Mollic epipedon thickness:** 7 to 17 inches, commonly includes part of argillic horizon

**Solum thickness:** 20 to 40 inches

**Depth to bedrock:** 20 to 40 inches

**A horizon:**

Value—4 or 5 dry

Chroma—2 or 3

Rock fragments—15 to 60 percent, mainly gravel

Reaction—neutral or mildly alkaline

**Bt horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—gravelly loam or gravelly clay loam

Clay content—25 to 35 percent

Reaction—neutral or mildly alkaline, generally becoming more alkaline with depth

### **Ricert Series**

The Ricert series consists of very deep, well drained soils formed in thin loess deposits over alluvium weathered from mixed rock sources. Ricert soils are on fan piedmonts. Slopes are 2 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Natrargids



**Typical pedon:** Ricert gravelly silt loam, 4 to 8 percent slopes, in an area of the Ricert-Whirlo-Pineval association. Pebbles cover 30 percent and cobbles 5 percent of the soil surface:

A1—0 to 3 inches; pale brown (10YR 6/3) gravelly silt loam, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine vesicular pores; 30 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 8 inches thick)

A2—3 to 6 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; strong medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine vesicular pores; 5 percent pebbles; moderately alkaline (pH 8.0); abrupt smooth boundary. (0 to 5 inches thick)

Btn—6 to 15 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure; slightly hard, friable, sticky and plastic; common fine roots; common fine tubular pores; many moderately thick clay films on faces of peds; 10 percent pebbles; strongly alkaline (pH 8.8); clear smooth boundary. (4 to 9 inches thick)

Btnk—15 to 18 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (3 to 8 inches thick)

2Bqk1—18 to 24 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; very hard, very firm, brittle, nonsticky and nonplastic; few fine roots; common very fine tubular pores; 35 percent pebbles; many medium rounded lime seams; weak continuous silica cementation; strongly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (6 to 12 inches thick)

2Bqk2—24 to 29 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; common very fine interstitial pores; weak discontinuous silica cementation; 50 percent pebbles; many medium rounded lime seams; strongly effervescent; strongly alkaline (pH 8.6); gradual wavy boundary. (0 to 6 inches thick)

2Bk1—29 to 35 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, loose, nonsticky and nonplastic; few fine roots; common very fine interstitial pores; 50 percent pebbles; many medium rounded lime seams; strongly effervescent; very strongly alkaline (pH 9.2); diffuse wavy boundary. (0 to 11 inches thick)

2Bk2—35 to 60 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; common very fine interstitial pores; 30 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada; about 28 miles south of Battle Mountain, approximately 400 feet west and 1,870 feet south of the northeast corner of sec. 33, T. 26 N., R. 45 E.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from mid-May through November

*Soil temperature:* 47 to 52 degrees F

*Depth to Bqk horizon:* 14 to 25 inches

*Depth to 2Bk horizon:* 20 to 40 inches

*Control section:* Clay content—25 to 35 percent; rock fragments—0 to 10 percent, mainly pebbles

*A horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

*Btn and Btnk horizon:*

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3, 4, or 6

Texture—loam or clay loam

Reaction—strongly alkaline or very strongly alkaline

Exchangeable sodium—15 to 35 percent

*Bqk horizon (only in some pedons):*

Value—6 or 7 dry, 4 or 5 moist

Chroma—3, 4, or 6

Texture—loam, silt loam, clay loam

Reaction—strongly alkaline or very strongly alkaline

*2Bqk and 2Bk horizons:*

Texture—very gravelly sandy loam, very gravelly loamy sand, or extremely gravelly loamy sand; coarse sand in subhorizons of some pedons

Rock fragments—averages 35 to 70 percent,

commonly increases with depth, mainly pebbles

Reaction—strongly alkaline or very strongly alkaline

Gypsum—absent in many pedons

## Rixie Series

The Rixie series consists of very deep, poorly drained soils that formed in alluvium of some volcanic ash but mainly of mixed rock sources mostly of volcanic origin. Rixie soils are on flood plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Aquic Duric Haploxerolls

**Typical pedon:** Rixie silty clay loam:

- A1—0 to 4 inches; gray (10YR 5/1) silty clay loam, black (10YR 2/1) moist; strong very fine angular blocky structure; hard, friable, sticky and very plastic; many very fine and fine and common medium roots; many very fine interstitial and tubular pores; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 4 inches thick)
- A2—4 to 10 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; strong very fine and fine angular blocky structure; hard, friable, sticky and very plastic; common very fine random and common fine and medium oblique and horizontal roots; many very fine interstitial and tubular pores; strongly effervescent; moderately alkaline (pH 8.3); clear smooth boundary. (3 to 13 inches thick)
- C—10 to 14 inches; gray (10YR 6/1) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate very fine and fine angular blocky structure; hard, friable, sticky and plastic; many very fine and fine random and very few medium oblique roots; many very fine tubular and common very fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (2 to 6 inches thick)
- Ck—14 to 28 inches; white (10YR 8/2) silty clay loam, light brownish gray (2.5Y 6/2) moist; common fine distinct yellowish brown (10YR 5/6) mottles, reddish brown (5YR 4/4) moist; massive; hard, friable, sticky and plastic; common very fine and fine random roots; many very fine tubular pores; few fine irregularly shaped light gray (10YR 7/2 moist) silica-lime concretions; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 15 inches thick)
- Cqk—28 to 34 inches; white (10YR 8/2) silty clay loam, pale brown (10YR 6/3) moist; common fine distinct yellowish red (5YR 5/6) mottles, reddish brown (5YR 4/4) moist; weak very thin and thin platy structure; hard, firm, brittle, sticky and plastic; few very fine random roots; many very fine interstitial and tubular pores; few fine rounded silica-lime

concretions; many thin clay films lining pores; weak silica cementation; violently effervescent; moderately alkaline (pH 8.6); clear smooth boundary. (3 to 9 inches thick)

- C'k—34 to 43 inches; light gray (10YR 7/2) silty clay loam, brown (10YR 5/3) moist; common fine distinct reddish brown (5YR 5/4) mottles, dark reddish brown (5YR 3/4) moist; massive; slightly hard, very friable, sticky and very plastic; very few very fine random roots; many very fine tubular pores; many thin clay films lining pores; 5 percent pebbles; common fine to medium irregularly shaped white (10YR 8/1) silica-lime concretions; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 10 inches thick)
- C'qk—43 to 52 inches; very pale brown (10YR 7/3) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, brittle, slightly sticky and slightly plastic; very few very fine random roots; many very fine tubular and few fine tubular pores; 10 percent pebbles; weak silica cementation; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 9 inches thick)
- 2C—52 to 62 inches; light gray (2.5Y 7/2) very gravelly sand, grayish brown (2.5Y 5/2) moist; single grained; loose, nonsticky and nonplastic; 45 percent less than 1 inch pebbles; slightly effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; about 5 miles northeast of Battle Mountain, approximately 3,400 feet north and 900 feet west of the southeast corner of sec. 17, T. 32 N., R. 45 E.

### Range in Characteristics

**Soil moisture:** Dry in mid-summer and early fall, moist in late fall through early summer; apparent seasonal water table at a depth of 24 to 48 inches in winter through early summer; drained phases recognized

**Soil temperature:** 47 to 51 degrees F

**Mollic epipedon thickness:** 10 to 16 inches

**Depth to weak continuous silica cementation:** 24 to 38 inches

**Control section:** Clay content—25 to 35 percent when mixed; texture—dominantly clay loam and silty clay loam; thin strata of fine sandy loam to silty clay and volcanic ash in most pedons

**Profile reaction:** Mildly alkaline to very strongly alkaline

**Effervescence:** Calcareous throughout; dominantly strongly to violently effervescent but some subhorizons are slightly effervescent

**Other features:** Some pedons have a layer below a depth of 40 inches of sandy loam to sand commonly modified by rock fragments

*A horizon:*

Hue—10YR or 2.5Y

Value—3 to 5 dry, 2 or 3 moist

Chroma—1 or 2

Structure—weak to strong, very thin to thick platy; moderate or strong, very fine to medium granular, angular blocky, or subangular blocky; massive in some pedons

Consistence—soft to hard dry

Other features—buried A horizon as much as 6 inches thick in some pedons

*C horizons:*

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—1 to 4

Consistence—slightly hard to extremely hard dry

Mottles—high chroma or yellowish hue in any horizon below a depth of 12 inches

Other features—Ck horizons that have few to many, fine or medium, extremely hard, silica-lime-cemented concretions below depths of 14 inches

**Robson Series**

The Robson series consists of shallow, well drained soils that formed in residuum derived from igneous rock. Robson soils are on crests and side slopes of hills and mountains. Slopes are 8 to 50 percent. Mean annual precipitation is about 15 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Xerollic Haplargids

**Typical pedon:** Robson very cobbly loam, 15 to 30 percent slopes, in an area of the Zoesta-Robson-Softscrabble association, in Lander County, south part. Pebbles cover approximately 30 percent and cobbles and stones 50 percent of the soil surface:

A—0 to 2 inches; grayish brown (10YR 5/2) very cobbly loam, dark brown (10YR 3/3) moist; moderate thin platy structure parting to moderate fine granular; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine vesicular pores; 10 percent pebbles, 40 percent cobbles, 5 percent stones; neutral (pH 6.8); abrupt smooth boundary. (2 to 10 inches thick)

Bt1—2 to 5 inches; pale brown (10YR 6/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine and few medium roots; common

very fine and fine interstitial pores; few fine clay films on peds; 10 percent pebbles, 35 percent cobbles; neutral (pH 6.8); abrupt smooth boundary. (3 to 6 inches thick)

Bt2—5 to 15 inches; pale brown (10YR 6/3) very cobbly clay, dark brown (10YR 4/3) moist; strong medium and coarse angular blocky structure; hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; many moderately thick clay films in pores and on peds; 20 percent pebbles, 35 percent cobbles; mildly alkaline (pH 7.8); clear irregular boundary. (4 to 10 inches thick)

R—15 inches; fractured andesite.

**Type location:** Lander County, Nevada, south part; approximately 1,500 feet east and 750 feet north of the southwest corner of sec. 29, T. 20 N., R. 47 E. (part of the BLM private contract completed in Lander County)

**Range in Characteristics**

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 44 to 47 degrees F

*Depth to bedrock:* 12 to 20 inches

*Control section:* Clay content—40 to 50 percent; rock fragments—50 to 75 percent when mixed, mainly cobbles

*A horizon:*

Hue—7.5YR or 10YR

Value—5 or 6 dry, 3 or 4 moist; the uppermost 7 inches averages more than 5.5 dry when mixed

Chroma—2 or 3

Structure—very thin or thin platy or very fine to medium subangular blocky or granular

*Bt horizon:*

Hue—7.5YR or 10YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Structure—weak to strong, very fine to coarse prismatic, subangular blocky, or angular blocky

Reaction—neutral or mildly alkaline

Other features—the uppermost few inches of bedrock commonly fractured into angular cobble- or pebble-size fragments in most pedons

**Roca Series**

The Roca series consists of moderately deep, well drained soils that formed in residuum and colluvium weathered from chert and shale. Roca soils are on south-facing side slopes of mountains. Slopes are 15 to 75 percent. Mean annual precipitation is about 10

inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Xerollic Haplargids

**Typical pedon:** Roca very gravelly loam, 30 to 50 percent slopes, in an area of the Roca-Linrose-Wiskan association. Pebbles cover 45 percent of the soil surface:

A—0 to 5 inches; light brownish gray (10YR 6/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thin and medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine tubular and common very fine vesicular pores; 40 percent pebbles, 1 percent cobbles; neutral (pH 7.2); clear smooth boundary. (3 to 6 inches thick)

Bt1—5 to 10 inches; pale brown (10YR 6/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and common fine roots; many very fine tubular pores; 35 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 14 inches thick)

Bt2—10 to 18 inches; yellowish brown (10YR 5/4) very gravelly clay, brown (10YR 4/3) moist; strong fine angular blocky structure; hard, firm, sticky and plastic; common very fine and few fine roots; many very fine tubular pores; continuous moderately thick clay films on faces of peds and lining pores; 50 percent pebbles; mildly alkaline (pH 7.4); gradual wavy boundary. (6 to 16 inches thick)

Bt3—18 to 27 inches; light yellowish brown (10YR 6/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; hard, firm, sticky and plastic; common very fine roots; many very fine tubular pores; continuous moderately thick clay films on faces of peds and lining pores; 50 percent pebbles; mildly alkaline (pH 7.8); abrupt irregular boundary. (0 to 10 inches thick)

2R—27 inches; fractured chert.

**Type location:** Lander County, Nevada; about 15 miles southeast of Battle Mountain, approximately 1,000 feet south and 2,000 feet east of the northwest corner of sec. 24, T. 30 N., R. 46 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 43 to 47 degrees F

**Depth to bedrock:** 20 to 40 inches

**A horizon:**

Hue—10YR or 2.5Y

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—granular or platy

Reaction—slightly acid to mildly alkaline

**Bt horizon:**

Hue—10YR or 7.5YR; 2.5Y in the lower subhorizons of some pedons

Value—5 to 7 dry, 3 to 7 moist

Chroma—3 to 6

Texture—very gravelly clay or very gravelly clay loam

Clay content—35 to 50 percent

Rock fragments—35 to 50 percent, mainly pebbles

Structure—moderate or strong, medium or fine angular blocky or subangular blocky

Reaction—neutral to moderately alkaline, usually becoming more alkaline with depth

Other features—secondary carbonates, violently effervescent in the lower subhorizons in some pedons

### Rose Creek Series

The series consist of very deep, poorly drained soils that formed in stratified mixed alluvium. Rose Creek soils are on flood plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Fluvaquent Haploxerolls

**Typical pedon:** Rose Creek silty clay loam:

A1—0 to 3 inch; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate very thin and thin platy structure parting to moderate very fine subangular blocky; hard, firm, sticky and very plastic; common very fine random and common fine and medium vertical and oblique roots; few very fine interstitial and tubular pores; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (0.5 inch to 3 inches thick)

A2—3 to 10 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; few fine distinct red (2.5YR 4/6) mottles, dark red (2.5YR 3/6) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; many very fine random and common fine oblique, vertical, and horizontal roots; common very fine vesicular, interstitial, and tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 8 inches thick)

A3—10 to 14 inches; gray (10YR 5/1) very fine sandy loam, very dark grayish brown (10YR 3/2) moist;

common fine distinct reddish brown (2.5YR 4/4) mottles, dark reddish brown (2.5YR 3/4) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; common very fine random and common fine vertical and oblique roots; common very fine vesicular, interstitial, and tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (0 to 10 inches thick)

C1—14 to 34 inches; grayish brown (2.5Y 5/2) very fine sandy loam, dark grayish brown (10YR 4/2) moist; medium distinct reddish brown (2.5YR 4/4) mottles, dark reddish brown (2.5YR 3/4) moist; massive; soft, very friable, nonsticky and slightly plastic; common very fine random, common fine vertical and oblique, and few medium oblique and horizontal roots; many very fine interstitial and tubular pores; krotovina, 2 to 3.5 inches in diameter, in the approximate center of the horizon; a horizontal lens of silt loam 2 or 3 inches thick crosses the horizon; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 20 inches thick)

C2—34 to 51 inches; light brownish gray (10YR 6/2) very fine sandy loam, dark grayish brown (2.5Y 4/2) moist; many medium distinct reddish brown (2.5YR 4/4) mottles, dark reddish brown (2.5YR 3/4) moist; massive; soft, very friable, nonsticky and slightly plastic; few very fine and fine random and few medium oblique and horizontal roots; many very fine interstitial and tubular pores; one medium horizontal root paralleling the horizon boundary at 50 to 51 inches; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (10 to 20 inches thick)

2C3—51 to 60 inches; variegated very gravelly sand; single grained; loose, nonsticky and nonplastic; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; approximately 1.1 miles northeast of Battle Mountain, about 900 feet south and 500 feet east of the northwest corner of sec. 16, T. 32 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Dry in mid-summer and early fall, moist in late fall, winter, spring, and early summer; during most years, saturated to within a depth of 10 inches for short periods; apparent seasonal high water table at a depth of 20 to 36 inches in spring; drained phases recognized

**Soil temperature:** 47 to 52 degrees F

**Mollic epipedon thickness:** 10 to 18 inches

**Control section:** Clay content—8 to 18 percent when averaged; texture—averages sandy loam, fine

sandy loam, very fine sandy loam, or loam that is more than 15 percent fine sand and coarser particles; includes stratified sand to silt loam and may include strata of coarse sand or silty clay loam

**Rock fragments:** The coarser textures as much as 15 percent pebbles in some pedons

**Effervescence:** Slightly effervescent in most of the profile but individual horizons noneffervescent to violently effervescent in some pedons

**Profile reaction:** Neutral to very strongly alkaline, depending on the presence of sodium and lime

#### A horizon:

Hue—10YR or 2.5Y

Value—4 or 5 dry, 2 or 3 moist, the uppermost 1 to 3 inches in some pedons has value of 7 dry and 4 moist as a result of flood deposition

Chroma—1 or 2

Structure—weak or moderate, fine to coarse subangular blocky or prismatic structure; very thin to thick platy in the immediate surface; massive in some pedons

Consistence—hard dry in some pedons, but not in massive horizons

Other features—buried A horizon in some pedons

#### C horizons:

Hue—10YR to 5Y

Value—5 to 7 dry and 3 to 6 moist

Chroma—1, 2, or 3

Mottles—iron mottles that have hue of 2.5YR to 10YR and chroma of 3 to 8 generally at a depth of 20 to 40 inches but as shallow as 3 inches in some pedons irrigated by controlled flooding

### Rosney Series

The Rosney series consists of very deep, well drained soils that formed in loess capped silty alluvium or lacustrine materials derived from some volcanic ash but mainly of mixed rock sources. Rosney soils are on alluvial flat remnants and fan skirts. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Rosney silt loam:

A1—0 to 3 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderate thick and very thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine random and very few fine and medium vertical roots; many very fine vesicular and interstitial pores;

violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 7 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; strong coarse prismatic structure parting to moderate medium and thick platy; slightly hard, very friable, slightly sticky and slightly plastic; common very fine random and common fine and medium oblique roots; common very fine tubular pores; fine gypsum crystals in filaments and threads; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 5 inches thick)

C1—7 to 16 inches; pale brown (10YR 6/3) silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine random, few fine and medium oblique, and few medium horizontal roots; common very fine tubular pores; one 3- to 4-inch krotovina; violently effervescent; strongly alkaline (pH 8.9); clear wavy boundary. (5 to 10 inches thick)

C2—16 to 25 inches; very pale brown (10YR 7/3) silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine random and very few medium oblique roots; many very fine tubular pores; fine gypsum crystals in filaments and threads; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (9 to 25 inches thick)

2C3—25 to 32 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; few fine faint mottles, brown (7.5YR 4/4) moist; massive; slightly hard, friable, sticky and plastic; few very fine random roots; many very fine tubular pores; gypsum crystals in filaments and threads; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (7 to 15 inches thick)

2C4—32 to 53 inches; pale brown (10YR 6/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, sticky and plastic; very few very fine random and very few fine vertical roots; many very fine tubular pores; fine gypsum crystals in filaments and threads; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 22 inches thick)

2C5—53 to 60 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; weak thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; fine gypsum crystals in filaments and threads; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 5 miles southeast of Battle Mountain, approximately 2,100

feet west and 2,000 feet south of the northeast corner of sec. 36, T. 32 N., R. 45 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in part for short periods from late October through May

*Soil temperature:* 47 to 52 degrees F

*Depth to 2C horizon:* 20 to 36 inches

*Control section:* Clay content—10 to 18 percent in the upper part and 25 to 35 percent in the lower part, averages 20 to 30 percent; texture—dominantly silt loam that has thin strata of very fine sandy loam and volcanic ash in the upper part over stratified silt loam to silty clay, dominantly silty clay loam in the lower part

*Mineralogy:* Mixed but influenced by volcanic ash and other pyroclastic materials

*Profile reaction:* Moderately alkaline to very strongly alkaline

*Effervescence:* Slightly effervescent to violently effervescent

*Electrical conductivity:* 15 to 35 mmhos/cm

*Exchangeable sodium:* 35 to 80 percent

*Profile color:*

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 or 5 moist

Chroma—2, 3, or 4

*Other features:* Few to many crystals of gypsum generally present, common only in the lower part of the substratum in some pedons; weakly to strongly silica-cemented horizons below a depth of 40 inches in some pedons

*A horizon:*

Structure—weak to moderate, thin to thick platy; massive in some pedons

### Settlemyer Series

The Settlemyer series consists of very deep, poorly drained soils that formed in alluvium derived from mixed rock sources. Settlemyer soils are on flood plains and inset fans. Slopes are 0 to 4 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Fluvaquent Haplaquolls

**Typical pedon:** Settlemyer fine sandy loam, drained, 0 to 4 percent slopes:

A1—0 to 5 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate very thin and thin platy structure; slightly hard, friable, nonsticky and nonplastic; common very fine and

fine roots; common fine vesicular pores; mildly alkaline (pH 7.7); clear smooth boundary. (4 to 7 inches thick)

A2—5 to 10 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine and fine interstitial pores; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 12 inches thick)

A3—10 to 16 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; common medium faint dark grayish brown (10YR 4/2 moist) mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; common worm casts; moderately alkaline (pH 7.9); clear smooth boundary. (3 to 7 inches thick)

AC—16 to 24 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; common medium distinct yellowish brown (10YR 5/4 moist) and very dark brown (10YR 2/2 moist) mottles; weak medium angular blocky structure; slightly hard, friable, very sticky and plastic; common very fine and fine roots; common very fine tubular pores; common fine lime filaments; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 8 inches thick)

C1—24 to 36 inches; brown (10YR 5/3) silt loam, dark brown (10YR 4/3) moist; few fine distinct dark brown (7.5YR 4/4 moist) and gray (N 5/0 moist) mottles; massive; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; few fine lime seams; moderately alkaline (pH 8.0); gradual smooth boundary. (5 to 20 inches thick)

2C2—36 to 65 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; few fine distinct dark brown (7.5YR 4/4 moist) and gray (N 5/0 moist) mottles; massive; slightly hard, friable, sticky and plastic; few very fine roots; common very fine tubular pores; mildly alkaline (pH 7.8).

**Type location:** Lander County, Nevada; about 32 miles southwest of Battle Mountain, approximately 900 feet east and 2,550 feet south of the northwest corner of sec. 7, T. 27 N., R. 42 E.

#### Range in Characteristics

**Soil moisture:** Dry in mid-summer and early fall, moist in late fall through early summer; apparent seasonal water table at a depth of 12 to 36 inches in winter and spring; drained phases recognized

**Soil temperature:** 47 to 52 degrees F

**Mollic epipedon thickness:** 12 to 24 inches

**Control section:** Clay content—25 to 35 percent when mixed; texture—clay, silty clay, silty clay loam, clay loam, loam, silt loam, or very fine sandy loam; sand fraction and pebble-size fragments—15 to 30 percent fine sand or coarser particles

**Profile reaction:** Neutral to very strongly alkaline, the higher values only in sodium-affected pedons

**Other features:** O horizon as much as 6 inches thick in some pedons, mainly undecomposed plants and stems

#### A and AC horizons:

Value—4 or 5 dry, 2 or 3 moist

Chroma—1, 2, or 3

Structure—weak to strong, fine or medium prismatic, platy, blocky, or granular; massive in some pedons

Consistence—slightly hard or hard dry

Effervescence—noneffervescent or slightly effervescent in the upper part of the A horizon, not effervescent in all parts of the profile between 10 to 20 inches

#### C horizon:

Hue—10YR, 2.5Y, or 5Y

Value—5 or 6 dry, 3 or 4 moist

Chroma—1, 2, or 3

Structure—weak, medium and fine angular blocky; massive in some pedons

Consistence—slightly hard or hard dry

Mottles—distinct or prominent iron mottles of reddish, greenish, or yellowish hues and chromas of 1 to 4, or the matrix base colors indicative of gleying

Other features—some pedons have a few small 1/4- or 3/4-inch lime concretions

#### 2C horizon:

Effervescence—noneffervescent or slightly effervescent

### Shabliss Series

The Shabliss series consists of shallow, well drained soils that formed in alluvium derived from mixed rock sources with a thin mantle of volcanic ash. Shabliss soils are on fan piedmont remnants. Slopes are 2 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Haploxerollic Durorthids

**Typical pedon:** Shabliss very fine sandy loam, 2 to 8 percent slopes, in an area of Bioya-Shabliss-Puett association. Pebbles cover 10 percent and cobbles 4 percent of the soil surface:

- A1—0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many fine vesicular pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 6 inches thick)
- A2—2 to 6 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 4 inches thick)
- Bw—6 to 11 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; lime coatings on underside of rock fragments; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (4 to 9 inches thick)
- Bq—11 to 16 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; 5 percent pebbles; discontinuously weakly silica cemented; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 6 inches thick)
- Bqkm—16 to 34 inches; very pale brown (10YR 7/3) strongly silica- and lime-cemented duripan, pale brown (10YR 6/3) moist; strong thick platy structure with loam between plates; very hard, very firm; 25 percent pebbles, 25 percent cobbles; violently effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (5 to 18 inches thick)
- 2Ck—34 to 60 inches; very pale brown (10YR 7/3) gravelly loamy sand, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine and fine tubular pores; 20 percent pebbles, 5 percent cobbles; many fine lime filaments; violently effervescent; strongly alkaline (pH 8.8).
- Type location:** Lander County, Nevada; about 22 miles north of Battle Mountain, approximately 1,100 feet south and 1,600 feet west of the northeast corner of sec. 18, T. 36 N., R. 45 E.

#### Range In Characteristics

*Soil moisture:* Usually dry, moist in winter and spring  
*Soil temperature:* 47 to 55 degrees F  
*Depth to base of Bw horizon:* 10 to 15 inches

*Depth to strongly cemented duripan:* 10 to 20 inches

*Control section:* Clay content—5 to 15 percent; texture—averages very fine sandy loam, silt loam, or loam that has thin strata of fine sandy loam in some pedons

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist  
 Chroma—2 or 3  
 Reaction—neutral to moderately alkaline

#### Bw horizon:

Value—5 or 6 dry  
 Chroma—2 to 4  
 Reaction—neutral to strongly alkaline

#### Bq or Bqk horizon (in some pedons):

Cementation—5 to 45 percent durinodes in a friable or brittle matrix

#### Bqkm horizon:

Structure—platy; massive in some pedons  
 Consistence—very hard or extremely hard  
 Other features—two or more strongly cemented layers interbedded with weakly cemented material in some pedons

#### C horizon:

Clay content—0 to 10 percent  
 Rock fragments—gravelly or very gravelly loamy sand below the duripan in some pedons  
 Reaction—moderately to very strongly alkaline  
 Cementation—Cqk horizon that has 5 to 45 percent extremely hard, extremely firm, brittle 1/8- to 1/2-inch cylindrical durinodes in a friable or firm matrix or is continuously weakly silica cemented in some pedons

### Skullwak Series

The Skullwak series consists of very deep, poorly drained soils that formed in fine textured lacustrine sediments derived from mixed rock sources. Skullwak soils are on lake plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine, montmorillonitic (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Skullwak silt loam, in an area of the Skullwak-Umberland-Wendane association:

A—0 to 2 inches; light gray (10YR 7/2) silt loam, pale brown (10YR 6/3) moist; moderate medium platy structure; hard, friable, sticky and plastic; few very fine roots; common very fine vesicular pores; strongly effervescent; very strongly alkaline (pH 9.4); abrupt smooth boundary. (1 to 4 inches thick)



- C—2 to 10 inches; light gray (10YR 7/2) silty clay loam, yellowish brown (10YR 5/4) moist; moderate fine angular blocky structure; hard, friable, very sticky and very plastic; common very fine and fine roots; common very fine tubular and interstitial pores; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary. (6 to 11 inches thick)
- 2Cqk—10 to 17 inches; light gray (10YR 7/2) silty clay loam, yellowish brown (10YR 5/4) moist; many medium distinct light brownish gray (2.5Y 6/2 moist) and light gray (2.5Y 7/2 moist) mottles; moderate fine angular blocky structure; hard, friable, very sticky and very plastic; common very fine, fine, and medium roots; common very fine interstitial pores; 15 percent 15- to 25-millimeter, strongly cemented durinodes; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 7 inches thick)
- 3Cqkg1—17 to 30 inches; white (5Y 8/2) silty clay, light olive gray (5Y 6/2) moist; many medium distinct light gray (5Y 7/2 moist) and yellowish brown (10YR 5/4 moist) mottles; massive; very hard, very firm, very sticky and very plastic; common very fine and fine roots; few very fine tubular pores; 75 percent strongly cemented durinodes and discontinuous masses; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (6 to 22 inches thick)
- 3Cqkg2—30 to 37 inches; light gray (5Y 7/2) silty clay loam, olive gray (5Y 5/2) moist; common fine distinct light gray (5Y 7/2 moist) and yellowish brown (10YR 5/4 moist) mottles; massive; slightly hard, friable, very sticky and very plastic; few very fine roots; few very fine tubular pores; 75 percent strongly cemented durinodes and discontinuous masses; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (7 to 32 inches thick)
- 3Cg1—37 to 46 inches; light gray (5Y 7/2) silty clay, light olive gray (5Y 6/2) moist; many common distinct olive (5Y 5/6 moist) mottles; moderate fine angular blocky structure; slightly hard, friable, very sticky and very plastic; few very fine roots; few very fine tubular pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 9 inches thick)
- 3Cg2—46 to 60 inches; light gray (5Y 7/2) silty clay loam, light olive gray (5Y 6/2) moist; few fine distinct olive (5Y 5/6 moist) mottles; massive; hard, firm, very sticky and very plastic; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; approximately 41 miles northeast of Austin in Carico Lake Valley,

about 2,400 feet south and 2,200 feet west of the projected northeast corner of sec. 3, T. 23 N., R. 47 E.

### Range in Characteristics

*Soil moisture:* Saturated year round at a depth of 18 to 36 inches

*Soil temperature:* 47 to 52 degrees F

*Depth to Cqk horizon:* 8 to 14 inches

*Control section:* Clay content—35 to 45 percent when mixed; texture—stratified silty clay loam or silty clay

*Reaction throughout the profile:* Moderately alkaline to very strongly alkaline, generally becoming less alkaline with depth

*Salt:* Strongly affected above the Cqk horizon and moderately affected within and below the Cqk horizon

*Sodium:* 25 to 40 percent exchangeable sodium above the Cqk horizon and 15 to 30 percent within and below

*A horizon:*

Value—7 or 8 dry, 4, 5, or 6 moist

Chroma—2 or 3

*C and Cqk horizons:*

Hue—10YR in the upper part and 5Y or 2.5Y in the lower part

Chroma—2 to 4 in the upper part and 1 or 2 in the lower part

### Slaven Series

The Slaven series consists of moderately deep, well drained soils that formed in residuum of chert, shale, and quartzite with a small component of loess and volcanic ash. Slaven soils are on side slopes of mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 44 F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Slaven very gravelly loam, 30 to 50 percent slopes, in an area of the Slaven-Glean-Cleavage association. Pebbles cover 45 percent and cobbles 5 percent of the soil surface:

- A1—0 to 2 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and few medium roots; many very fine and fine interstitial pores; 40 percent pebbles, 5 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (0.5 inch to 5 inches thick)

**A2**—2 to 4 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, very friable, sticky and plastic; many very fine and few fine roots; many very fine and fine interstitial pores; 40 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear wavy boundary. (2 to 5 inches thick)

**Bt1**—4 to 9 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common thin clay films on faces of peds and in pores; 45 percent pebbles, 10 percent cobbles; neutral (pH 7.2); clear wavy boundary. (3 to 5 inches thick)

**Bt2**—9 to 22 inches; yellowish brown (10YR 5/4) extremely gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate fine and medium subangular blocky structure; hard, friable, very sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores; common thin and few thick clay films on faces of peds and in pores; 50 percent pebbles, 15 percent cobbles; neutral (pH 7.3); clear wavy boundary. (12 to 26 inches thick)

**R**—22 inches; slightly fractured chert.

**Type location:** Lander County, Nevada; about 18 miles south of Battle Mountain, approximately 2,000 feet west and 1,500 feet south of the northeast corner of sec. 15, T. 28 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 44 to 47 degrees F

**Mollic epipedon thickness:** 7 to 12 inches, commonly includes the upper part of the argillic horizon

**Depth to bedrock:** 20 to 40 inches

**Reaction throughout the profile:** Slightly acid or neutral

#### A horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, value of 6 only to a depth of 2 inches or less; dry value less than 5.5 when mixed to a depth of 7 inches

Chroma—2 or 3

Structure—weak or moderate, very fine or fine subangular blocky, granular, or platy; massive in some pedons

#### Bt horizon:

Hue—10YR or 7.5YR

Value—4 to 6 dry, 3 to 5 moist

Chroma—commonly 3 or 4, as high as 6 in some pedons

Texture—clay, sandy clay, clay loam

Clay content—35 to 45 percent

Rock fragments—ranges from 50 to 75 percent in the upper subhorizon and averages 60 to 75 percent for all subhorizons

Structure—weak or moderate, fine or medium angular or subangular blocky

Consistence—hard or very hard dry, friable or firm moist

### Snapp Series

The Snapp series consists of very deep, well drained soils formed in alluvium derived from mixed rocks. Snapp soils are on fan piedmont remnants. Slopes are 4 to 8 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Clayey over sandy or sandy-skeletal, montmorillonitic, mesic Durixerollic Natrargids

**Typical pedon:** Snapp gravelly very fine sandy loam, 4 to 8 percent slopes, in an area of the Tomera-Snapp-Whirlo association. Pebbles cover 45 percent of the soil surface:

**A1**—0 to 4 inches; light brownish gray (10YR 6/2) gravelly very fine sandy loam, dark grayish brown (10YR 4/2) moist; weak very thin and thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine and medium roots; many very fine vesicular and few very fine and fine tubular pores; 30 percent pebbles; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 10 inches thick)

**A2**—4 to 10 inches; pale brown (10YR 6/3) gravelly silt loam, brown (10YR 4/3) moist; strong thin and medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine vesicular and common very fine tubular pores; 15 percent pebbles; moderately alkaline (pH 8.2); gradual smooth boundary. (0 to 6 inches thick)

**Btn**—10 to 17 inches; pale brown (10YR 6/3) gravelly clay, brown (10YR 4/3) moist; strong medium and coarse prismatic structure; hard, firm, very sticky and very plastic; many very fine and few fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 20 percent pebbles; slightly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (0 to 7 inches thick)

**Btnk**—17 to 25 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; strong medium and coarse prismatic structure; hard, firm, very sticky and very plastic;

few very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 30 percent pebbles, 1 percent cobbles; thin lime coatings on undersides of rock fragments; strongly effervescent; few fine lime filaments and threads; strongly alkaline (pH 9.0); gradual wavy boundary. (5 to 20 inches thick)

**Bk**—25 to 30 inches; very pale brown (10YR 7/3) gravelly clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, sticky and plastic; few very fine roots; common very fine interstitial and few very fine tubular pores; 25 percent pebbles, 5 percent cobbles; thin lime coatings on undersides of rock fragments; violently effervescent; common fine lime filaments and threads; strongly alkaline (pH 8.8); gradual smooth boundary. (0 to 10 inches thick)

**2Bqk**—30 to 37 inches; very pale brown (10YR 7/3 and 8/3) very gravelly loamy sand, brown (10YR 5/3) and pale brown (10YR 6/3) moist; massive; hard, brittle; few very fine roots; common very fine interstitial pores; weak continuous silica and lime cementation with discontinuous strongly cemented masses; 50 percent pebbles, 1 percent cobbles; violently effervescent; strongly alkaline (pH 8.6); gradual wavy boundary. (8 to 20 inches thick)

**2C**—37 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly loamy sand, yellowish brown (10YR 5/4) moist; massive; few very fine roots; common very fine interstitial pores; 70 percent pebbles, 1 percent cobbles; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 17 miles south of Battle Mountain, approximately 2,500 feet south and 2,500 feet east of the northwest corner of sec. 10, T. 29 N., R. 44 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from June through October

**Soil temperature:** 47 to 52 degrees F

**Combined thickness of A and Bt horizons:** 20 to 30 inches

**Depth to discontinuity:** 20 to 40 inches

**Depth to Bqk horizons:** 20 to 30 inches

**Depth to segregated lime:** 3 to 17 inches

**Reaction throughout the profile:** Moderately alkaline to very strongly alkaline

**Other features:** Some pedons have C horizons below depths of 3 feet

#### A1 horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2, 3, or 4

#### Bt horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—clay loam, gravelly clay loam, clay, or gravelly clay

Clay content—35 to 60 percent

Rock fragments—5 to 35 percent, mainly pebbles

Structure—angular blocky or prismatic

Exchangable sodium—15 to 25 percent

#### Bk horizon (in some pedons):

Value—6 or 7 dry, 4 or 5 moist

Chroma—3, 4, or 5

Rock fragments—15 to 35 percent, mainly pebbles

Structure—subangular blocky; massive in some pedons

#### 2Bqk horizon:

Value—6, 7, or 8 dry, 5, 6, or 7 moist

Chroma—3 to 6

Texture—very gravelly or extremely gravelly loamy sand or sand

Rock fragments—35 to 70 percent, mainly pebbles

Segregated gypsum—gypsum as soft masses or filaments

Silica cementation—continuously weakly silica cemented in some subhorizons above a depth of 40 inches

### Sodhouse Series

The Sodhouse series consists of shallow, well drained soils that formed in alluvium of some loess and volcanic ash but mainly of mixed rock sources. Sodhouse soils are on fan piedmont remnants. Slopes are 8 to 15 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Durorthids

**Typical pedon:** Sodhouse stony very fine sandy loam, 8 to 15 percent slopes, in an area of the Orovida-Sodhouse association. Stones cover 2 percent of the soil surface:

**A**—0 to 3 inches; pale brown (10YR 6/3) stony very fine sandy loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine tubular pores; 2 percent stones; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 6 inches thick)

**Bw**—3 to 10 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; weak medium

subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine tubular pores; 5 percent cobbles, 2 percent stones; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 7 inches thick)

**Bqk**—10 to 17 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; 10 percent 3- to 5-millimeter durinodes; common fine round lime concretions; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (0 to 7 inches thick)

**2Bqkm**—17 to 29 inches; white (10YR 8/2) indurated duripan, pale brown (10YR 6/3) moist; massive; abrupt smooth boundary. (10 to 24 inches thick)

**2Cqk1**—29 to 47 inches; very pale brown (10YR 7/3) gravelly sandy loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; 25 percent pebbles, 10 percent cobbles; 15 percent 15- to 30-millimeter durinodes; violently effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 30 inches thick)

**3Cqk2**—47 to 60 inches; white (10YR 8/2) very gravelly loamy sand, pale brown (10YR 6/3) moist; massive; very hard, firm, nonsticky and nonplastic; few very fine roots; about 30 percent pebbles, 5 percent cobbles, 10 percent stones; continuously weakly silica cemented; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** Lander County Nevada; about 20 miles north of Battle Mountain, 1,600 feet north and 1,700 feet west of the southeast corner of sec. 8, T. 35 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist for short periods in winter and spring

**Soil temperature:** 47 to 53 degrees F

**Depth to indurated duripan:** 14 to 20 inches

**Thickness of duripan:** 6 to 30 inches

**Depth to Ck or Cqk horizon:** 25 to 44 inches

**Control section:** Clay content—8 to 15 percent

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline, generally becoming more alkaline with depth

**Other features:** Durinodes and lime accumulations common in subhorizons immediately above the duripan of some pedons; strongly cemented duripans below a depth of 50 inches in some pedons

**A horizon:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

**Other features**—normally noneffervescent, but some pedons slightly effervescent because of lime recharge from dust

**Bw horizons:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

**Texture**—very fine sandy loam, fine sandy loam, loam, silt loam, or gravelly loam

**Rock fragments**—5 to 35 percent, mainly pebbles

**Structure**—moderate subangular blocky; massive in some pedons

**2Bqkm horizon:**

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

**Structure**—platy; massive in some pedons

**2Cqk horizon:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

**Texture**—extremely gravelly sandy loam, gravelly sandy loam, very gravelly loamy sand, or gravelly loam

### Softscrabble Series

The Softscrabble series consists of very deep, well drained soils that formed in residuum and colluvium of some chert, quartzite, and shale but mainly of volcanic rocks. Softscrabble soils are on side slopes of mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 16 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Pachic Argixerolls

**Typical pedon:** Softscrabble very cobbly loam, 30 to 50 percent slopes, in an area of the Zoesta-Robson-Softscrabble association, in Lander County, south part. Pebbles cover 30 percent, cobbles 15 percent, and stones 10 percent of the soil surface:

**A1**—0 to 3 inches; dark brown (10YR 4/3) very cobbly loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure; slightly hard, friable, nonsticky and nonplastic; many very fine and common fine roots; many very fine vesicular pores; 25 percent pebbles, 20 percent cobbles, 10 percent stones; neutral (pH 7.0); clear smooth boundary. (2 to 10 inches thick)

**A2**—3 to 9 inches; dark brown (10YR 4/3) gravelly

loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine to coarse roots; many very fine and fine tubular pores; 15 percent pebbles, 5 percent cobbles, 5 percent stones; neutral (pH 7.0); clear smooth boundary. (5 to 10 inches thick)

Bt1—9 to 16 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine tubular pores; common thin clay films on faces of peds; 25 percent pebbles, 5 percent cobbles; neutral (pH 7.2); clear wavy boundary. (7 to 20 inches thick)

Bt2—16 to 22 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate coarse angular blocky structure; hard, friable, sticky and plastic; common very fine and fine and few medium and coarse roots; common fine tubular pores; common thin and few moderately thick clay films on faces of peds; 10 percent pebbles, 35 percent cobbles, 10 percent stones; neutral (pH 6.8); clear wavy boundary. (4 to 18 inches thick)

Bt3—22 to 30 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; common very fine and few fine roots; common fine tubular pores; many thin and few moderately thick clay films in pores and on faces of peds; 20 percent pebbles, 15 percent cobbles, 5 percent stones; neutral (pH 6.8); gradual wavy boundary. (0 to 7 inches thick)

2Bt4—30 to 37 inches; brown (7.5YR 5/4) very gravelly clay loam, dark brown (7.5YR 3/4) moist; strong medium angular blocky structure; hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds; 25 percent pebbles; neutral (pH 6.6); gradual smooth boundary. (0 to 12 inches thick)

3Bt5—37 to 60 inches; light brown (7.5YR 6/4) very gravelly clay loam, dark brown (7.5YR 4/4) moist; weak angular blocky structure; hard, friable, sticky and plastic; very few very fine roots; few very fine tubular pores; common moderately thick clay films on peds; 55 percent pebbles; neutral (pH 7.0).

**Type location:** Lander County, Nevada, south part; about 15 miles east of Austin, approximately 1,000 feet west and 500 feet north of the southeast corner of sec. 1, T. 19 N., R. 46 E. (part of the BLM contract completed in Lander County)

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from mid-July through early October

*Soil temperature:* 44 to 47 degrees F

*Mollic epipedon thickness:* 20 to 38 inches

*Depth to base of Bt horizon:* 60 to 80 inches

*Control section:* Clay content—27 to 35 percent

Rock fragments—35 to 70 percent pebbles and cobbles with few stones, when mixed

*Reaction throughout the profile:* Slightly acid or neutral

#### A horizon:

Hue—10YR or 7.5YR

Value—3 to 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—platy, granular, subangular blocky

#### Bt horizon:

Hue—10YR or 7.5YR

Value—4, 5, or 6 dry, 3 or 4 moist

Chroma—2 to 4 (4 in lower part only)

Texture—loam and clay loam with an average of 35 to 70 percent rock fragments; as few as 5 percent rock fragments in individual horizons

### Sombrero Series

The Sombrero series consists of shallow, somewhat poorly drained soils that formed in loess overlying loamy alluvium or lake sediments from some volcanic ash but from mainly mixed rock sources. Sombrero soils are on stream terraces. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Aqueptic Durorthids

**Typical pedon:** Sombrero very fine sandy loam:

A1—0 to 4 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 5/3) moist; moderate coarse prismatic structure parting to moderate very thin and thin platy; slightly hard, very friable, nonsticky and slightly plastic; few very fine random roots; many very fine vesicular and tubular pores; violently effervescent; very strongly alkaline (pH 9.2); abrupt wavy boundary. (2 to 5 inches thick)

A2—4 to 8 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderate coarse and very coarse prismatic structure; hard, very friable, slightly sticky and slightly plastic; common very fine random and few fine oblique roots; common very fine tubular pores; violently effervescent; very strongly alkaline (pH 9.2); abrupt wavy boundary. (3 to 6 inches thick)

- C**—8 to 16 inches; light gray (10YR 7/2) silt loam, yellowish brown (10YR 5/4) moist; few fine distinct dark yellowish brown (10YR 4/4) mottles; moderate fine and medium platy structure; hard, very friable, slightly sticky and slightly plastic; common very fine random and very few fine and medium oblique roots; common very fine tubular pores; violently effervescent; very strongly alkaline (pH 9.2); abrupt wavy boundary. (7 to 12 inches thick)
- Cqm**—16 to 42 inches; light gray (10YR 7/2) strongly silica-cemented duripan, yellowish brown (10YR 5/4) moist; massive; very hard, extremely firm; very few very fine and fine random roots; common very fine interstitial and tubular pores; violently effervescent; very strongly alkaline (pH 9.6); clear wavy boundary. (5 to 26 inches thick)
- 2C'1**—42 to 57 inches; very pale brown (10YR 7/3) gravelly sandy loam, brown (10YR 4/3) moist; common fine distinct yellowish brown (10YR 5/4) mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine interstitial and tubular pores; silica coatings between sand grains; about 25 percent rounded, 2- to 10-millimeter pebbles; very slightly effervescent; strongly alkaline (pH 9.0); abrupt irregular boundary. (8 to 16 inches thick)
- 3C'2**—57 to 67 inches; light variegated gravelly sand; single grained; loose, nonsticky and nonplastic; about 30 percent rounded, 2- to 15-millimeter pebbles; very slightly effervescent; strongly alkaline (pH 9.0).

**Type location:** Lander County, Nevada; about 6.5 miles south of Battle Mountain, approximately 100 feet south and 1,400 feet west of the northeast corner of sec. 20, T. 31 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Dry mid-summer and early fall, moist in part late fall through early summer; seasonal high water table at a depth of 36 to 60 inches in late winter or spring; saturated at a depth of 30 to 40 inches in spring in most years

**Soil temperature:** 47 to 52 degrees F

**Depth to strongly cemented duripan:** 15 to 20 inches

**Profile colors:**

Value—5 to 7 dry, 3 to 5 moist

Chroma—1 to 3 dry, 2 to 4 moist

**Control section:** Clay content—20 to 30 percent when mixed; texture—silt loam or silty clay loam, when averaged; sand fraction—less than 15 percent fine sand and coarser particles; mineralogy—some volcanic ash and other pyroclastic materials but mainly mixed sources

**Profile reaction:** Strongly alkaline or very strongly alkaline, becoming less alkaline with depth

**Salt and sodium:** Moderately or strongly salt and sodium affected in the upper part of the profile and slightly affected in the lower part

**Other features:** Strata of unconformable gravelly sand and sandy loam at any depth below the continuously silica-cemented layer; faint or distinct yellowish brown mottles in the lower part of the C horizon; variable amounts of mica in some pedons

### Sonoma Series

The Sonoma series consists of very deep, poorly drained soils that formed in silty alluvium of some volcanic ash but mainly of mixed rocks. In some areas stream channel entrenchment has altered drainage. Sonoma soils are on flood plains and basin floor remnants. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aeric Fluvaquents

**Typical pedon:** Sonoma silty clay loam, frequently flooded:

- A**—0 to 3 inches; gray (10YR 6/1) silty clay loam, very dark gray (10YR 3/1) moist; strong fine and medium subangular blocky structure; hard, very friable, slightly sticky and plastic; many very fine and fine random and common medium oblique and vertical roots; common very fine interstitial and tubular pores; 1- to 2-millimeter-thick white (10YR 8/1) depositional surface crust, light brownish gray (10YR 6/2) moist; violently effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary. (2 to 10 inches thick)
- AC**—3 to 8 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; common fine distinct reddish yellow (7.5YR 6/6) mottles, brown (7.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and plastic; many very fine random and common very fine tubular pores; few wormcasts with colors of the A horizon; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 12 inches thick)
- C1**—8 to 17 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; common fine distinct light brown (7.5YR 6/4) mottles, brown (7.5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and plastic; common very fine random and few fine and medium oblique and vertical roots;

many very fine interstitial and tubular pores; few wormcasts with colors of the A horizon; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 14 inches thick)

C2—17 to 29 inches; light gray (10YR 7/1) silty clay loam, grayish brown (2.5Y 5/2) moist; common fine distinct brown (7.5YR 4/4) mottles, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, sticky and plastic; few very fine random and few medium oblique roots; many very fine interstitial and tubular pores; common thin clay films lining pores; about 1 percent 5- to 10-millimeter, hard, firm, brittle durinodes; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (8 to 35 inches thick)

C3—29 to 40 inches; white (2.5Y 8/2) silty clay loam, grayish brown (2.5Y 5/2) moist; common fine distinct brown (7.5YR 4/4) mottles, dark brown (7.5YR 3/2) moist; massive; slightly hard, friable, sticky and plastic; few very fine random and few fine and medium oblique roots; many very fine interstitial and tubular pores; common thin clay films lining pores; thin light gray (2.5Y 7/2) moist lime in seams; violently effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary. (0 to 16 inches thick)

C4—40 to 65 inches; white (2.5Y 8/2) silt loam, grayish brown (2.5Y 5/2) moist; common fine distinct strong brown (7.5YR 5/6) mottles, brown (7.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and plastic; very few very fine random and very few fine oblique roots; many very fine and fine interstitial and tubular pores; many thin clay films lining pores; light gray (10YR 7/2 moist) lime in soft masses; violently effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; about 2.6 miles northeast of Battle Mountain, approximately 1,320 feet west and 530 feet south of the northeast corner of sec. 15, T. 32 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Unless drained, saturated in spring and early summer, water table below a depth of 40 inches during the rest of the year

**Soil temperature:** 49 to 53 degrees F

**Depth to buried A horizon (where present):** 30 to 55 inches

**Control section:** Clay content—25 to 35 percent; texture—silt loam to silty clay loam that has strata of clay or silty clay in some pedons

**Carbonates:** Calcium carbonate equivalent 3 to 12 percent throughout the profile, strongly or violently effervescent

#### A horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 3 to 5 moist

Chroma—1 or 2

Structure—thin or thick platy, fine or medium subangular blocky

Reaction—moderately to very strongly alkaline; buried A horizon (where present) is moderately or strongly alkaline

#### C horizon:

Hue—10YR to 5Y

Value—6 to 8 dry, 3 to 5 moist

Chroma—1 or 2; 3 in some pedons

Structure—platy or subangular blocky; massive in some pedons

Reaction—Moderately to very strongly alkaline

Other features—freshwater crustacean shells and 1/4- to 1/2-inch-diameter lime concretions in most pedons

### Sonoma Variant

The Sonoma Variant consists of very deep, very poorly drained soils that formed in some loess and volcanic ash but mainly in silty alluvium. Sonoma Variant soils are on basin floor remnants with the water table under artesian pressure. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-silty, mixed (calcareous), mesic Typic Fluvaquents

**Typical pedon:** Sonoma Variant silt loam:

A1—0 to 3 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak very fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine matted roots; common fine tubular pores; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 10 inches thick)

A2—3 to 11 inches; gray (10YR 6/1) silt loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots; common fine tubular pores; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (3 to 12 inches thick)

Cg—11 to 20 inches; light gray (10YR 7/1) silt loam, dark gray (10YR 4/1) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; common fine tubular pores; violently

effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 14 inches thick)

2Abg1—20 to 33 inches; dark gray (10YR 4/1) silt loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common fine and medium roots; strongly alkaline (pH 8.7); abrupt smooth boundary. (8 to 35 inches thick)

2Abg2—33 to 60 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; strongly alkaline (pH 8.7).

**Type location:** Lander County, Nevada; approximately 17 miles south of Cortez, about 400 feet west and 1,300 feet north of the southeast corner of sec. 32, T. 24 N., R. 48 E.

#### Range in Characteristics

*Soil moisture:* Moist year round; fluctuating water table between a depth of 6 to 18 inches throughout the year

*Soil temperature:* 47 to 52 degrees F

*Control section:* Clay content—10 to 18 percent

*A horizon:*

Hue—2.5Y or 10YR or N

Value—6 or 7 dry, 3 to 5 moist

### Soolake Series

The Soolake series consists of very deep, somewhat excessively drained soils that formed in alluvium derived from mixed rock sources. Soolake soils are on alluvial flat remnants. Slopes are 0 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Typic Torriorthents

**Typical pedon:** Soolake very fine sandy loam, 0 to 2 percent slopes, in an area of the Soolake-Dunphy-Argenta association:

A1—0 to 6 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular and tubular pores; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (2 to 6 inches thick)

A2—6 to 13 inches; light gray (10YR 7/2) very fine sandy loam, yellowish brown (10YR 5/4) moist; moderate medium and thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic;

common very fine and few fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (4 to 8 inches thick)

C—13 to 22 inches; very pale brown (10YR 7/3) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (6 to 10 inches thick)

Ck—22 to 49 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; common fine irregularly shaped segregated lime concretions and soft masses; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (20 to 35 inches thick)

Cqk—49 to 62 inches; light gray (10YR 7/2) loamy fine sand, brown (10YR 4/3) moist; few fine faint relict yellowish brown (10YR 5/4 moist) mottles; massive; hard, friable and firm, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 10 percent 10- to 20-millimeter, weakly cemented durinodes; common fine and medium irregularly shaped segregated lime filaments or threads; weak and very weak silica cementation; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; approximately 14 miles north of Battle Mountain, about 1,800 feet south and 2,640 feet east of the northwest corner of sec. 8, T. 34 N., R. 45 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, intermittently moist in winter and spring

*Soil temperature:* 48 to 53 degrees F

*Control section:* Texture—upper part very fine sandy loam or fine sandy loam, silt loam in some pedons; lower part loamy fine sand to sand

*Reaction throughout the profile:* Strongly alkaline or very strongly alkaline

*A horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry, 3 to 5 moist

Chroma—2 to 4

Structure—platy or prismatic

Effervescence—slightly or strongly effervescent

*C horizon:*

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4



Effervescence—strongly or violently effervescent  
 Duric material—up to 20 percent weakly cemented durinodes in any subhorizon below a depth of 10 inches; continuous very weak or weak silica cementation below a depth of 40 inches in most pedons  
 Other features—normally slightly saline-alkali above a depth of 13 inches and strongly saline-alkali below

### ***Spike Series***

The Spike series consists of very deep, well drained soils that formed in gravelly alluvium derived from mixed rock sources. Spike soils are on side slopes of fan piedmont remnants and partial ballenas. Slopes are 30 to 50 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Haplargids

**Typical pedon:** Spike very gravelly sandy loam, 30 to 50 percent slopes, in an area of the Pula-Spike association, in Lander County, south part. Pebbles cover 70 percent and cobbles 5 percent of the soil surface:

- A1—0 to 1 inch; very pale brown (10YR 7/3) very gravelly sandy loam, dark brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many fine vesicular pores; 35 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 6 inches thick)
- A2—1 to 2 inches; pale brown (10YR 6/3) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure; slightly hard, friable, slightly sticky and plastic; few very fine roots; many fine vesicular and tubular pores; 25 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 1 inch thick)
- Btn—2 to 6 inches; yellowish brown (10YR 5/6) very gravelly clay, dark yellowish brown (10YR 4/6) moist; strong fine angular blocky structure; very hard, firm, very sticky and very plastic; common very fine and fine roots; common very fine and fine tubular pores; many moderately thick clay films on faces of peds and in pores; 45 percent pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (1 to 6 inches thick)
- Btnk1—6 to 14 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, yellowish brown (10YR 5/4)

moist; weak fine subangular blocky structure; very hard, friable, very sticky and plastic; few fine roots; common very fine and fine tubular and interstitial pores; common thin clay films on faces of peds and in pores; 45 percent pebbles, 10 percent cobbles; common medium soft lime masses and common thin coatings on the undersides of rock fragments; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (2 to 8 inches thick)

Btnk2—14 to 18 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy clay loam, dark yellowish brown (10YR 4/6) moist; massive; very hard, firm, sticky and plastic; few very fine roots; common very fine and fine tubular pores; common thin clay films bridging mineral grains; 60 percent pebbles, 5 percent cobbles; common thin lime coatings on undersides of rock fragments; strongly effervescent; strongly alkaline (pH 8.6); gradual wavy boundary. (0 to 5 inches thick)

Btnk3—18 to 30 inches; very pale brown (10YR 7/4) extremely gravelly sandy clay loam, brownish yellow (10YR 6/6) moist; massive; hard, friable, sticky and plastic; very few fine roots; common very fine and fine interstitial pores; common thin clay films bridging mineral grains; 55 percent pebbles, 10 percent cobbles; common medium soft lime masses and common coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.4); gradual wavy boundary. (0 to 12 inches thick)

Btky1—30 to 44 inches; very pale brown (10YR 7/4) extremely gravelly clay loam, brownish yellow (10YR 6/6) moist; massive; hard, friable, sticky and plastic; very few fine roots; common very fine and fine interstitial pores; common thin clay films bridging mineral grains; 55 percent pebbles, 10 percent cobbles; common medium soft lime masses and common thin coatings on undersides of rock fragments; common medium filaments of gypsum; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary. (10 to 16 inches thick)

Btky2—44 to 60 inches; very pale brown (10YR 7/3) extremely gravelly sandy clay loam, light yellowish brown (10YR 6/4) moist; massive; hard, friable, sticky and plastic; few fine tubular pores; common thin clay films bridging mineral grains; 55 percent pebbles, 10 percent cobbles; common medium soft lime masses and common thin coatings on undersides of coarse fragments; common medium filaments of gypsum; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada, south part; approximately 22 miles north of Austin, about 600

feet south and 2,300 feet east of the northwest corner of sec. 24, T. 23 N., R. 43 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

*Soil moisture:* Moist in winter and early spring, dry mid-May through October

*Soil temperature:* 47 to 53 degrees F

*Depth to secondary carbonates:* 5 to 12 inches

*Depth to secondary gypsum:* 12 to 35 inches

*Depth to base of Bt horizon:* 40 to more than 60 inches

*Control section:* Clay content—27 to 35 percent; rock fragments—35 to 60 percent

*Reaction throughout the profile:* Moderately alkaline to strongly alkaline

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2, 3, or 4

#### B horizon:

Value—5, 6, or 7 dry, 4, 5, or 6 moist

Chroma—3, 4, or 6

Structure—angular blocky; subangular blocky; massive in the lower subhorizons in some pedons

Exchangeable sodium—15 to 35 percent

#### B<sub>tn</sub> horizon:

Texture—very gravelly clay, very gravelly clay loam, very gravelly sandy clay

Clay content—35 to 45 percent

Rock fragments—35 to 60 percent, mainly pebbles

#### B<sub>tnk</sub> and B<sub>tky</sub> horizons:

Texture—extremely gravelly clay loam, extremely gravelly sandy clay loam, extremely gravelly loam, very gravelly loam, very gravelly clay loam

Clay content—20 to 30 percent, when mixed

Rock fragments—50 to 75 percent, mainly pebbles

Other features—extremely gravelly sandy loam or extremely gravelly loam below a depth of 40 inches in some pedons

### Stingdorn Series

The Stingdorn series consists of shallow, well drained soils that formed in residuum of rhyolite, andesite, and tuff. Stingdorn soils are on crests and side slopes of foothills and hills. Slopes are 4 to 50 percent. Mean annual temperature is about 49 degrees, and mean annual precipitation is about 6 inches.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Durargids

**Typical pedon:** Stingdorn very cobbly loam, 4 to 30 percent slopes. Pebbles cover 5 percent and cobbles 40 percent of the soil surface:

A—0 to 7 inches; light brownish gray (10YR 6/2) very cobbly loam, dark brown (10YR 4/3) moist; weak thick platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine vesicular pores; 5 percent pebbles, 40 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 7 inches thick)

B<sub>t1</sub>—7 to 11 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine and few coarse roots; common very fine and fine tubular pores; few thin clay films in pores and on faces of peds; 5 percent pebbles, 30 percent cobbles; moderately alkaline (pH 8.2); clear wavy boundary. (4 to 11 inches thick)

B<sub>t2</sub>—11 to 15 inches; yellowish brown (10YR 5/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine and few coarse roots; common very fine and fine tubular pores; many moderately thick clay films in pores and on faces of peds; 5 percent indurated pan fragments; 10 percent pebbles, 30 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (0 to 4 inches thick)

B<sub>qkm</sub>—15 to 20 inches; very pale brown (10YR 7/3) indurated duripan; pale brown (10YR 6/3) moist; several thin indurated horizontal lamella at intervals throughout strongly silica-cemented matrix; 2- to 5-millimeter-thick indurated laminar cap covers bedrock; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (0.25 inch to 5 inches thick)

R—20 inches; unweathered tuff.

**Type location:** Lander County, Nevada; approximately 42 miles southwest of Battle Mountain, about 1,500 feet east and 1,400 feet north of the southwest corner sec. 31, T. 26 N., R. 41 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist for short periods in winter and spring

*Soil temperature:* 47 to 54 degrees F

*Combined thickness of A and B<sub>t</sub> horizons:* 7 to 16 inches

*Depth to indurated duripan over hard bedrock:* 8 to 20 inches

*A horizon:*

Hue—10YR or 2.5Y  
 Value—6 or 7 dry, 4 or 5 moist  
 Chroma—2 or 3  
 Consistence—soft or slightly hard dry  
 Reaction—mildly alkaline to strongly alkaline

*Bt horizon:*

Hue—10YR or 2.5Y  
 Value—5 or 6 dry, 4 or 5 moist  
 Chroma—3 or 4  
 Clay content—averages 27 to 35 percent; slightly less in some subhorizons of some pedons  
 Rock fragments—35 to 50 percent, mainly pebbles  
 Consistence—slightly hard or hard dry, very friable or friable moist  
 Reaction—mildly alkaline to strongly alkaline  
 Carbonates—slightly to strongly effervescent in some pedons; noneffervescent in the upper part of some pedons

*Bqk horizon (only in some pedons):*

Hue—10YR or 2.5Y  
 Value—6, 7, or 8 dry, 6 or 7 moist  
 Chroma—2 or 3  
 Reaction—moderately alkaline or strongly alkaline

**Sumine Series**

The Sumine series consists of moderately deep, well drained soils that formed in residuum and colluvium derived from quartzite, breccia, and sandstone. Sumine soils are on side slopes of mountains. Slopes are 15 to 75 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic Argixerolls

**Typical pedon:** Sumine cobbly loam, 30 to 50 percent slopes, in an area of the Walti-Sumine-Softscrabble association. Pebbles cover 15 percent and cobbles 15 percent of the soil surface:

- A1—0 to 5 inches; brown (10YR 5/3) cobbly loam, dark brown (10YR 3/3) moist; weak medium platy structure parting to moderate fine granular; soft, friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores; 10 percent pebbles, 10 percent cobbles; slightly effervescent; neutral (pH 7.2); gradual smooth boundary. (2 to 5 inches thick)
- A2—5 to 10 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard,

friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many very fine interstitial and common very fine tubular pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 7.3); clear smooth boundary. (3 to 5 inches thick)

Bt1—10 to 13 inches; pale brown (10YR 6/3) gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; common fine and very fine roots; common very fine interstitial and tubular pores; few thin clay films on faces of pedis; 30 percent pebbles; neutral (pH 7.3); clear wavy boundary. (3 to 8 inches thick)

Bt2—13 to 19 inches; pale brown (10YR 6/3) very gravelly clay loam, dark brown (10YR 4/3) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; common moderately thick clay films lining pores and on faces of pedis; 35 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.6); clear wavy boundary. (5 to 15 inches thick)

Bt3—19 to 24 inches; light yellowish brown (10YR 6/4) very cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; common moderately thin clay films on faces of pedis; 25 percent pebbles, 20 percent cobbles; mildly alkaline (pH 7.8); abrupt wavy boundary. (0 to 12 inches thick)

Bt4—24 to 30 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, firm, sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; 25 percent pebbles, 40 percent cobbles; mildly alkaline (pH 7.8); abrupt wavy boundary. (0 to 12 inches thick)

2R—30 inches; quartzite.

**Type location:** Lander County, Nevada; approximately 28 miles south of Battle Mountain, about 50 feet west and 1,000 feet south of the northeast corner of sec. 32, T. 26 N., R. 44 E.

**Range in Characteristics**

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 42 to 47 degrees F

*Mollic epipedon thickness:* 8 to 15 inches, may include the upper part of the Bt horizon

*Depth to bedrock:* 20 to 40 inches

*Combined thickness of the A and Bt horizons:* 20 to 40 inches

*Control section:* Clay content—25 to 35 percent when

mixed; texture—dominantly clay loam, thin horizons of loam or clay in some pedons; rock fragments—35 to 60 percent when averaged

*Profile reaction:* Neutral or mildly alkaline

*A horizon:*

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—weak or moderate, very thin to medium platy or very fine to medium granular or subangular blocky

Consistence—soft or slightly hard dry, very friable or friable moist

*Bt horizon:*

Hue—10YR or 7.5YR

Value—4, 5, or 6 dry, 2, 3, or 4 moist

Chroma—3 or 4

Structure—weak to strong, very fine to medium angular or subangular blocky; massive in the lower part of some pedons

## **Susie Creek Series**

The Susie Creek series consists of deep, well drained soils that formed in residuum of some loess and volcanic ash but mainly of andesite and basalt. Susie Creek soils are on summits of plateaus. Slopes are 2 to 8 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Durargidic Argixerolls

**Typical pedon:** Susie Creek silt loam, 2 to 8 percent slopes, in an area of the Susie Creek-Millerlux association:

A1—0 to 4 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 4 inches thick)

A2—4 to 9 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine and common medium roots; many very fine and fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 9 inches thick)

Bt1—9 to 16 inches; pale brown (10YR 6/3) silty clay, dark brown (10YR 4/3) moist; strong fine and medium subangular blocky structure; hard, firm, very sticky and very plastic; many very fine and fine and common medium roots; few fine tubular pores; common thin clay films on faces of peds;

moderately alkaline (pH 8.0); clear smooth boundary. (5 to 12 inches thick)

Bt2—16 to 27 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; few fine and medium roots; few very fine tubular pores; continuous moderately thick clay films on faces of peds; moderately alkaline (pH 8.0); clear wavy boundary. (4 to 11 inches thick)

2Bqk1—27 to 31 inches; very pale brown (10YR 7/3) sandy loam, light yellowish brown (10YR 6/4) moist; massive; hard, very firm, slightly sticky and slightly plastic; few fine and medium roots; few very fine tubular pores; weakly silica cemented; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (5 to 20 inches thick)

2Bqk2—31 to 42 inches; white (10YR 8/2) sandy loam, very pale brown (10YR 7/3) moist; massive; hard, very firm, nonsticky and nonplastic; common very fine tubular pores; 10 percent pebbles; strongly effervescent; weakly silica cemented; roots mostly on surface of horizon and in numerous fractures; strongly alkaline (pH 8.8); abrupt smooth boundary. (0 to 20 inches thick)

3R—42 inches; basalt.

**Type location:** Lander County, Nevada; about 7 miles northeast of Battle Mountain, approximately 1,100 feet south and 1,200 feet west of the northeast corner of sec. 14, T. 33 N., R. 46 E.

### **Range in Characteristics**

*Soil moisture:* Usually dry, moist in part from October through late June

*Soil temperature:* 45 to 47 degrees F

*Mollic epipedon thickness:* 7 to 12 inches

*Depth to base of Bt horizon:* 20 to 30 inches

*Depth to weak silica cementation:* 20 to 36 inches

*Depth to paralithic or lithic contact:* 40 to more than 60 inches

*Control section:* Clay content—35 to 50 percent when mixed; texture—clay, silty clay, sandy clay, or clay loam; rock fragments—0 to 15 percent

*Other features:* Some pedons have a thin AB or BA horizon and common or many uncoated sand grains on faces of peds

*A horizon:*

Value—4 or 5 dry

Chroma—2 or 3

Structure—moderate or strong, very fine to medium granular, platy, or subangular blocky

Reaction—neutral or mildly alkaline

**Bt horizon:**

Value—5 to 7 dry, 4 to 6 moist  
 Chroma—3 or 4  
 Structure—moderate or strong, fine or medium prismatic or blocky  
 Consistence—friable to very firm moist  
 Reaction—mildly alkaline or moderately alkaline

**2Bqk horizon:**

Hue—2.5Y or 10YR  
 Value—6 to 8 dry, 5 to 7 moist  
 Chroma—2 to 4  
 Texture—loam, sandy loam, or loamy sand  
 Reaction—moderately alkaline or strongly alkaline  
 Cementation—continuously weakly silica cemented  
 Consistence—very firm or firm and brittle when moist  
 Other features—Bq subhorizon that is weakly silica cemented and lacks secondary carbonates in some pedons

**Teguro Series**

The Teguro series consists of shallow, well drained soils that formed in residuum weathered from rhyolitic tuff. Teguro soils are on side slopes of foothills and mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Loamy, mixed, frigid Lithic Argixerolls

**Typical pedon:** Teguro very gravelly loam, 30 to 50 percent slopes, in an area of the Punchbowl-Teguro-Sumine association. Pebbles cover 55 percent of the soil surface:

- A—0 to 4 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine vesicular pores; 35 percent pebbles; neutral (pH 6.8); abrupt smooth boundary. (1 to 4 inches thick)
- Bt1—4 to 9 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; many fine and few very fine and medium roots; common very fine and fine tubular and interstitial pores; common thin clay films on faces of peds and lining pores; 30 percent pebbles; neutral (pH 7.0); clear smooth boundary. (3 to 7 inches thick)
- Bt2—9 to 16 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4)

moist; moderate medium angular blocky structure; slightly hard, friable, very sticky and very plastic; common very fine, fine, and medium roots; few very fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 30 percent pebbles; neutral (pH 7.2); abrupt irregular boundary; (4 to 10 inches thick)

R—16 inches; rhyolitic tuff.

**Type location:** Lander County, Nevada; about 14 miles southwest of Battle Mountain, approximately 2,600 feet east and 1,500 feet south of the northwest corner of sec. 2, T. 31 N., R. 42 E.

**Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry mid-July through early October

**Soil temperature:** 43 to 47 degrees F

**Mollic epipedon:** 7 to 12 inches thick, includes upper part of Bt horizon

**Thickness of A and Bt horizons and depth to bedrock:** 14 to 20 inches

**Control section:** Clay content—25 to 35 percent; rock fragments—15 to 35 percent, mainly pebbles

**Reaction throughout the profile:** Slightly acid or neutral

**A horizon:**

Value—4 or 5 dry, 2 or 3 moist  
 Chroma—2 or 3 dry or moist

**Bt horizon:**

Value—5 or 6 dry, 3 or 4 moist  
 Chroma—3 or 4 dry and moist  
 Texture—gravelly loam or gravelly clay loam

**Teman Series**

The Teman series consists of very deep, moderately well drained soils that formed in silty alluvium derived from mixed rock sources that are mostly of volcanic origin and high in content of pyroclastics material. Teman soils are on inset fans and fan skirts. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Durixerollic Calciorthids

**Typical pedon:** Teman silt loam:

- A1—0 to 4 inches; light brownish gray (2.5Y 6/2) silt loam, dark brown (10YR 3/3) moist; moderate very thin and thin platy structure; slightly hard, very friable, slightly sticky and plastic; few very fine roots; many very fine vesicular, interstitial, and tubular pores; strongly effervescent; moderately

alkaline (pH 8.2); clear smooth boundary. (3 to 5 inches thick)

A2—4 to 8 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate medium and coarse prismatic structure; slightly hard, very friable, sticky and plastic; common very fine and few fine and medium roots; common very fine tubular pores; common fine filaments of gypsum crystals; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 9 inches thick)

Bq1—8 to 21 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; many very fine and few fine and medium roots; common very fine tubular pores; few fine filaments of gypsum crystals; strong durinodes; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (7 to 19 inches thick)

Bq2—21 to 29 inches; light gray (10YR 7/2) silty clay loam, brown (10YR 5/3) moist; massive; hard, very friable, sticky and plastic; few very fine and fine roots; many very fine tubular pores; few fine filaments of gypsum crystals; 30 percent 5- to 20-millimeter, weak and moderately strong durinodes; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (5 to 8 inches thick)

Bqk—29 to 48 inches; white (10YR 8/2) silty clay loam, very pale brown (10YR 7/3) moist; common fine distinct light yellowish brown (10YR 6/4 moist) and yellowish brown (10YR 5/6 moist) mottles; massive; hard, very friable, sticky and plastic; few very fine and fine roots; many very fine and fine tubular pores; 25 percent 5- to 20-millimeter, weak and moderately strong durinodes and lime concretions; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (8 to 22 inches thick)

Bk—48 to 63 inches; mottled light gray (10YR 7/2) and white (10YR 8/2) silty clay loam, very pale brown (10YR 7/3) and white (10YR 8/2) moist; common fine distinct yellowish brown (10YR 5/4 moist) and dark yellowish brown (10YR 4/4 moist) mottles; massive; hard, friable, sticky and plastic; few very fine roots; many very fine and fine tubular pores; violently effervescent; common medium segregated lime concretions; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; approximately 8 miles south of Battle Mountain, about 2,250 feet south and 1,000 feet east of the approximate northwest corner of sec. 27, T. 31 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist in part from October through early June

**Soil temperature:** 47 to 53 degrees F

**Depth to calcic horizon:** 20 to 37

**Depth to Bq horizon:** 8 to 14 inches

**Control section:** Clay content—20 to 30 percent when mixed; texture—silt loam or silty clay loam; sand fraction and rock fragments—less than 15 percent fine sand and coarser, as much as 10 percent gravel below a depth of 40 inches in some pedons

**Calcic horizon:** 12 or more inches thick; 15 to 40 percent calcium carbonate equivalent and 5 to 30 percent 3- to 5-millimeter carbonate concretions

**Profile reaction:** Moderately alkaline or strongly alkaline, generally becoming more alkaline with depth

**Salts and sodium:** Normally strongly salt and slightly sodium affected below a depth of 8 inches and slightly affected above; strongly salt and moderately sodium affected throughout the profile in some pedons

**Consistence:** Slightly sticky or sticky wet

**Gypsum:** Segregated gypsum crystals at any depth below 3 inches

**A horizon:**

Hue—2.5Y or 10YR

Value—3 to 5 moist

Chroma—2 to 4

Structure—very thin to thick platy or very fine to coarse prismatic; massive in some pedons

**Bq and Bk horizons:**

Value—6 to 8 dry, 4 to 8 moist, light values in the lower subhorizons

Chroma—1 to 3 dry, 2 to 4 moist

Cementation—20 to 50 percent weak and moderately strong durinodes; strata of up to 50 percent weak discontinuous silica cementation in some pedons

Other features—strata of volcanic ash at a depth of 16 to 30 inches, 4 to 8 inches thick in some pedons

### Tenabo Series

The Tenabo series consists of shallow, well drained soils that formed in a thin mantle of loess and volcanic ash over alluvium derived from mixed rocks. Tenabo soils are on fan piedmonts. Slopes are 0 to 15 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Nadurargids

**Typical pedon:** Tenabo silt loam, 0 to 2 percent slopes, in an area of Beoska-Tenabo silt loams, nearly level:

- A1—0 to 7 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and plastic; common very fine random and few fine oblique roots; many very fine vesicular pores; 5 percent small pebbles; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 7 inches thick)
- A2—7 to 13 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; massive; hard, very friable, sticky and plastic; common very fine and fine random and very few medium and coarse oblique roots; common very fine vesicular and tubular and few fine tubular pores; 5 percent small pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (1 to 8 inches thick)
- Btn1—13 to 17 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate very fine and fine angular blocky; slightly hard, very friable, sticky and plastic; common very fine random roots; common very fine interstitial and tubular pores; common thin clay films on faces of peds and lining pores; 10 percent small pebbles; strongly alkaline (pH 8.6); clear smooth boundary. (1 to 4 inches thick)
- Btn2—17 to 20 inches; very pale brown (10YR 7/3) gravelly silty clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to moderate fine angular blocky; slightly hard, very friable, sticky and plastic; few very fine random and very few fine horizontal roots; common very fine interstitial and tubular pores; many thin clay films on faces of peds and lining pores; 20 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (3 to 8 inches thick)
- 2Bqkm1—20 to 24 inches; light yellowish brown (10YR 6/4) indurated duripan, dark yellowish brown (10YR 4/4) moist; common fine distinct reddish yellow (7.5YR 7/6 moist) and strong brown (7.5YR 5/6 moist) mottles; massive; very hard, very firm; very few very fine roots in fractures; few very fine tubular pores; continuous  $\frac{1}{16}$ - to  $\frac{1}{8}$ -inch-thick very pale brown (10YR 8/3 and 7/3 moist) silica laminae; about 30 percent small, rounded pebbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (4 to 19 inches thick)
- 2Bqkm2—24 to 39 inches; very pale brown (10YR 7/3) strongly silica-cemented duripan, dark yellowish brown (10YR 4/4) moist; massive; very hard, very firm; few very fine roots in fractures; many very fine interstitial pores; 1- to 3-inch-thick silica laminae lenses throughout; 70 percent rounded pebbles as much as  $\frac{1}{2}$  inch in diameter; strongly effervescent;

strongly alkaline (pH 8.4); gradual smooth boundary. (0 to 5 inches thick)

- 2C—39 to 60 inches; very pale brown (10YR 7/3) extremely gravelly loamy sand, dark yellowish brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine random roots; many very fine interstitial pores; a few discontinuous silica- and lime-cemented lenses; 75 percent rounded pebbles as much as  $1\frac{1}{2}$  inches in diameter; slightly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 50 miles southwest of Battle Mountain, approximately 1,320 feet west and 25 feet north of the southeast corner of sec. 27, T. 25 N., R. 42 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 51 degrees F

*Depth to duripan:* 9 to 20 inches

*Control section:* Clay content—27 to 35 percent; rock fragments—less than 20 percent when mixed

*Reaction throughout the profile:* Moderately or strongly alkaline in the A and Btn horizons and moderately to very strongly alkaline below the Btn horizon

*Other features:* In areas subject to recharge with lime, noneffervescent at the surface to violently effervescent in the layer above the duripan

### A horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—weak or moderate, very thin to thick platy; massive in some pedons

### Bt (where present) and Btn horizons:

Value—5 to 7 dry, 4 or 5 moist

Chroma—3, 4, or 6

Texture of fine earth—clay loam, silty clay loam, sandy clay loam and thin strata of silt loam in some pedons

Rock fragments—less than 20 percent, mainly pebbles, may include some duripan fragments

Structure—moderate fine or medium prismatic; angular blocky; or subangular blocky

Reaction—moderately alkaline or strongly alkaline, generally becoming more alkaline with depth

Exchangeable sodium—15 to 30 percent

Carbonates—the lower subhorizons of some pedons are violently effervescent and contain segregated lime

### Bqkm horizon:

Value—6 to 8 dry, 4 to 7 moist

Chroma—2 to 4

Other features—very hard to extremely hard continuous laminae stratified with strongly cemented materials

**2C horizon:**

Texture—gravelly to extremely gravelly sand, loamy sand, or sandy loam

Rock fragments—15 to 85 percent, mainly pebbles

## **Tessfive Series**

The Tessfive series consists of shallow, well drained soils formed in residuum of some loess but mainly of tuffaceous sediments. Tessfive soils are on crests and side slopes of rolling hills. Slopes are 8 to 30 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic Lithic Xeric Torriorthents

**Typical pedon:** Tessfive gravelly loam, 8 to 30 percent slopes, in an area of the Tessfive-Puett-Grina association. Pebbles cover approximately 35 percent of the soil surface:

A1—0 to 3 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; soft, very friable, sticky and plastic; few very fine roots; common very fine vesicular pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 5 inches thick)

A2—3 to 6 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable, slightly sticky and plastic; common very fine roots; common very fine interstitial pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 3 inches thick)

Bk1—6 to 10 inches; light brownish gray (10YR 6/2) gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, fine, and medium roots; few very fine tubular pores; few fine lime filaments or threads and lime coatings on undersides of rock fragments; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); gradual wavy boundary. (0 to 6 inches thick)

Bk2—10 to 16 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; few very fine tubular pores; few fine and medium lime filaments or threads and lime coatings on undersides of rock fragments; 25 percent

pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary. (3 to 6 inches thick)  
R—16 to 20 inches; hard, fractured consolidated tuffaceous sediments; lime coatings on rock fragments.

**Type location:** Lander County, Nevada; about 23 miles north of Austin in an unsectionized area, approximately 10,000 feet south and 4,250 feet west of the southwest corner of sec. 27, T. 24 N., R. 43 E.

### **Range in Characteristics**

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to bedrock:** 10 to 20 inches

**Control section:** Clay content—14 to 24 percent; texture—loam or sandy loam; rock fragments—20 to 35 percent, mainly pebbles

**Carbonates:** 5 to 15 percent

**Calcium carbonate equivalent:** A1 horizon leached of carbonates in some pedons

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Other features:** Highly weathered paralithic material in the upper few inches of bedrock in some pedons

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

**Bk horizon:**

Value—6, 7, or 8 dry, 4, 5, or 6 moist

Chroma—2 to 6

Structure—subangular blocky; massive in some pedons

Other features—up to 15 percent weakly cemented durinodes in the lower subhorizons of some pedons

## **Tomera Series**

The Tomera series consists of very deep, well drained soils that formed in mixed alluvium derived from sedimentary rocks and pyroclastic materials. Tomera soils are on fan piedmonts. Slopes are 8 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Xerollic Natrargids

**Typical pedon:** Tomera gravelly loam, 8 to 15 percent slopes, in an area of the Beowawe Variant-Tomera-Whirlo association:

A1—0 to 3 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; weak thin platy



structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 5 inches thick)

A2—3 to 8 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine tubular and few very fine vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 6 inches thick)

Bt—8 to 16 inches; yellowish brown (10YR 5/4) clay, dark brown (10YR 4/3) moist; moderate medium prismatic structure; very hard, very firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 10 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 12 inches thick)

Btnk1—16 to 27 inches; yellowish brown (10YR 5/4) gravelly sandy clay, dark yellowish brown (10YR 4/4) moist; weak fine prismatic structure parting to moderate fine subangular blocky; hard, firm, sticky and plastic; few very fine and fine roots; common very fine tubular pores; common thin clay films on faces of peds; 30 percent pebbles; common fine lime filaments and soft masses; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (6 to 14 inches thick)

Btnk2—27 to 33 inches; yellowish brown (10YR 5/4) gravelly sandy clay, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; few thin clay films on faces of peds; 30 percent pebbles; few fine soft lime masses; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (0 to 10 inches thick)

2Bk—33 to 60 inches; very pale brown (10YR 7/3) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 55 percent pebbles with thin (less than 1 millimeter) lime coatings on the undersides; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 15 miles south of Battle Mountain, approximately 1,000 feet south and 750 feet west of the northeast corner of sec. 6, T. 29 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry mid-June through October

**Soil temperature:** 47 to 50 degrees F

**Depth to lime:** 15 to 30 inches

**Depth to base of Btnk horizon:** 30 to 42 inches

**Control section:** Clay content—40 to 60 percent; rock fragments—10 to 30 percent

**Reaction throughout the profile:** Neutral to strongly alkaline, becoming more alkaline with depth

**Other features:** Thin clay loam AB horizon above the Bt horizon in some pedons

#### A horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 to 3

Structure—weak or moderate thin to thick platy

#### Bt and Btnk horizons:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 to 4

Texture—clay, gravelly clay, sandy clay, or gravelly sandy clay in the uppermost 20 inches; clay loam, gravelly clay loam, sandy clay loam, or gravelly sandy clay in the lower part

Structure—upper part, weak or moderate fine or medium prismatic; lower part, prismatic or weak or moderate, fine or medium subangular or angular blocky

Reaction—neutral to moderately alkaline in the upper part becoming moderately or strongly alkaline in the lower part

Other features—nonsaline or slightly saline

Exchangable sodium—1 to 10 percent in the upper subhorizon and 15 to 30 percent in the lower subhorizon

#### 2C (where present) or 2Bk horizon or both:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture—very gravelly loamy sand, extremely gravelly sandy loam, very cobbly loam

Rock fragments—5 to 25 percent cobbles, 25 to 70 percent pebbles

### Trunk Series

The Trunk series consists of moderately deep, well drained soils that formed in residuum and colluvium derived from andesite, rhyolite, chert, and quartzite. Trunk soils are on crests and convex side slopes of mountains and foothills. Slopes are 4 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Xerollic Haplargids

**Typical pedon:** Trunk cobbly loam, 30 to 50 percent slopes, in an area of the Trunk-Burrita-Rock outcrop association. Pebbles cover 15 percent and cobbles 10 percent of the soil surface:

A—0 to 5 inches; pale brown (10YR 6/3) cobbly loam, dark brown (10YR 4/3) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine interstitial pores; 10 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (3 to 6 inches thick)

Bt—5 to 11 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; strong very fine subangular blocky structure; hard, firm, sticky and plastic; common very fine, fine, and medium roots; common very fine and fine interstitial pores; few thin clay films on faces of peds; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); clear wavy boundary. (6 to 12 inches thick)

Btk1—11 to 17 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; strong fine prismatic structure parting to strong fine angular blocky; very hard, very firm, very sticky and very plastic; few very fine, fine, and coarse roots; common very fine and fine tubular pores; many moderately thick clay films lining pores and on faces of peds; 15 percent pebbles, 5 percent cobbles; common fine lime filaments and seams; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (4 to 12 inches thick)

Btk2—17 to 28 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure parting to strong fine angular blocky; very hard, very firm, very sticky and very plastic; few very fine, fine, and coarse roots; common very fine and fine tubular pores; many moderately thick clay films lining pores and on faces of peds; 15 percent pebbles, 5 percent cobbles; common fine lime filaments and seams; violently effervescent; moderately alkaline (pH 8.4); clear irregular boundary. (6 to 12 inches thick)

2R—28 inches; fractured andesite; lime coatings on fracture planes.

**Type location:** Lander County, Nevada; about 31 miles southwest of Battle Mountain, approximately 2,500 feet west and 1,250 feet south of the northeast corner of sec. 21, T. 26 N., R. 40 E.

### Range in Characteristics

**Soil moisture:** Usually dry, moist in late fall, winter, and early spring

**Soil temperature:** 48 to 53 degrees

**Depth to bedrock:** 20 to 40 inches

**Depth to lime:** 10 to 20 inches

**A horizon:**

Value—5 or 6 dry, 3 to 5 moist

Chroma—2 or 3

Reaction—neutral or mildly alkaline

**Bt and Btk horizons:**

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly clay loam or gravelly clay that is more than 30 percent sand

Clay content—35 to 50 percent

Rock fragments—15 to 35 percent, mainly pebbles

Reaction—neutral or mildly alkaline in noncalcareous upper subhorizon, moderately or strongly alkaline in calcareous lower subhorizon

### Tulase Series

The Tulase series consists of very deep, well drained soils that formed in silty alluvium of mixed rock sources, loess, and volcanic ash. Tulase soils are in lagoons and on inset fans and fan skirts. Slopes are 0 to 8 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-silty, mixed (calcareous), mesic Durorthidic Xeric Torriorthents

**Typical pedon:** Tulase silt loam, 2 to 8 percent slopes, in an area of the Tulase-Bubus-McConnel association:

A1—0 to 2 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 10 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium and coarse roots; common very fine and fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 10 inches thick)

C—6 to 11 inches; very pale brown (10YR 7/3) very fine

sandy loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (5 to 13 inches thick)

**Cq**—11 to 21 inches; very pale brown (10YR 7/3) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine tubular pores; 30 percent 10- to 25-millimeter, strong durinodes; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (6 to 13 inches thick)

**Cqk1**—21 to 36 inches; very pale brown (10YR 7/3) very fine sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine and fine tubular pores; 45 percent 10- to 25-millimeter, strong durinodes; 20 percent weak discontinuous silica cementation; common fine lime filaments; violently effervescent; strongly alkaline (pH 9.0); gradual wavy boundary. (9 to 18 inches thick)

**Cqk2**—36 to 60 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine and fine tubular pores; 30 percent 10- to 20-millimeter, strong durinodes; 10 percent weak discontinuous silica cementation; common fine lime filaments; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** Lander County, Nevada; about 28 miles southeast of Battle Mountain, approximately 2,500 feet east and 100 feet north of the southwest corner of sec. 18, T. 26 N., R. 48 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from late June through October

**Soil temperature:** 47 to 52 degrees F

**Depth to Cq horizon:** 11 to 20 inches

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

**C horizon:**

Value—4 or 5 moist

**Cq and Cqk horizons:**

Texture—silt loam or very fine sandy loam

Silica cementation—20 to 50 percent durinodes; up to 30 percent discontinuous silica-lime cementation in Cqk horizon in most pedons

### Tusel Series

The Tusel series consists of deep, well drained soils that formed in some loess that contains high amounts of pyroclastic material but mainly in residuum and colluvium weathered from quartzite, welded tuff, conglomerate, chert, and shale. Tusel soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 17 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Argic Pachic Cryoborolls

**Typical pedon:** Tusel very gravelly loam, 30 to 50 percent slopes, in an area of the Hapgood-Tusel-Winada association:

**A1**—0 to 8 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine vesicular and few very fine tubular pores; 30 percent pebbles, 5 percent cobbles; neutral (pH 6.6); clear smooth boundary. (2 to 10 inches thick)

**A2**—8 to 20 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 30 percent pebbles, 5 percent cobbles; neutral (pH 6.7); clear smooth boundary. (7 to 14 inches thick)

**2Bt**—20 to 42 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots and common very fine tubular pores; 40 percent pebbles, 20 percent cobbles; few thin clay films on faces of peds; neutral (pH 7.0); abrupt wavy boundary. (12 to 27 inches thick)

**3R**—42 inches; quartzite.

**Type location:** Lander County, Nevada; approximately 19 miles south of Battle Mountain, about 750 feet north and 2,500 feet west of the southeast corner of sec. 35, T. 29 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Usually moist in late fall through early summer, dry from late July through September

**Soil temperature:** 43 to 47 degrees F

**Average summer soil temperature:** 58 to 59 degrees F

**Mollic epipedon thickness:** 16 to 20 inches, includes the upper part of the argillic horizon in some pedons

**Depth to base of Bt horizon:** 36 to more than 50 inches

*Depth to bedrock:* 40 to more than 80 inches

*Control section:* Clay content—25 to 35 percent; rock fragments—50 to 75 percent, mainly pebbles

*Profile reaction:* Slightly acid or neutral

*A horizon:*

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—weak to strong, very fine to medium granular or subangular blocky

Consistence—soft or slightly hard dry

*2Bt horizon:*

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—2, 3, or 4

Texture—very gravelly or extremely gravelly sandy clay loam or very gravelly or extremely gravelly clay loam that is 40 to 60 percent sand

Clay content—25 to 35 percent when averaged

Rock fragments—40 to 60 percent pebbles and 10 to 25 percent cobbles

Structure—weak to strong subangular blocky or angular blocky; lower subhorizons massive in some pedons

## ***Tweba Series***

The Tweba series consists of very deep, very poorly drained soils that formed in loamy alluvium derived from mixed rock sources. Tweba soils are on flood plains.

Slopes are 0 to 4 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Aeric Fluvaquents

**Typical pedon:** Tweba very fine sandy loam, 0 to 4 percent slopes, in an area of the Wendane-Tweba association:

A1—0 to 2 inch; grayish brown (10YR 5/2) very fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine vesicular pores; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 7 inches thick)

A2—2 to 5 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; strongly effervescent; common fine lime filaments; few manganese coatings on faces of peds; moderately alkaline (pH 8.8); clear smooth boundary. (0 to 7 inches thick)

Ck1—5 to 11 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; strongly effervescent; common fine lime filaments; few manganese coatings on faces of peds; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 8 inches thick)

Ck2—11 to 21 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; strongly effervescent; few fine lime filaments; 5 percent durinodes; few manganese coatings on faces of peds; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 10 inches thick)

C1—21 to 29 inches; light brownish gray (10YR 6/2) loamy sand, dark grayish brown (10YR 4/2) moist; few fine yellowish red (5YR 5/6) mottles; massive; loose, nonsticky and nonplastic; few very fine roots; many fine interstitial pores; slightly effervescent; 10 percent durinodes; moderately alkaline (pH 8.2); clear smooth boundary. (4 to 12 inches thick)

C2—29 to 35 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; few fine yellowish red (5YR 5/6) mottles; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common fine tubular pores; strongly effervescent; 10 percent durinodes; moderately alkaline (pH 8.2); clear smooth boundary. (5 to 10 inches thick)

Ck'—35 to 60 inches; light brownish gray (10YR 6/2) very fine sandy loam, dark grayish brown (10YR 4/2) moist; common fine yellowish red (5YR 5/6) mottles; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common fine tubular pores; strongly effervescent; common fine lime filaments; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; about 20 miles northeast of Battle Mountain, approximately 120 feet north and 700 feet west of the southeast corner of sec. 17, T. 35 N., R. 47 E.

### **Range in Characteristics**

**Soil moisture:** Dry in midsummer and early fall, moist in late fall, winter, spring, and early summer; apparent seasonal high water table at a depth of 14 to 20 inches for some time during most years, usually February through June; drained phases recognized

**Soil temperature:** 47 to 52 degrees F

**Control section:** Clay content—10 to 18 percent when mixed; texture—averages fine sandy loam or very fine sandy loam, but includes stratified very fine

sandy loam, fine sandy loam, loam, or silt loam in the upper subhorizon and very fine sandy loam, fine sandy loam, sandy loam, loamy fine sand, or loamy sand in the lower subhorizon; loamy fine sand and loamy sand more common below a depth of 35 inches

*Other features:* One or more buried A horizons that have hue of 10YR or 5Y, value of 5 or 6 dry and 3 moist, and chroma of 1 or 2 below a depth of 30 inches in some pedons

*A horizon:*

Hue—2.5Y or 10YR

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 or 3

Structure—very fine angular blocky or very thin platy structure; massive in some pedons

Reaction—mildly alkaline to strongly alkaline

Effervescence—noneffervescent to strongly effervescent

*C horizon:*

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—1, 2, or 3 dry, 2 or 3 moist

Reaction—mildly alkaline to very strongly alkaline

Effervescence—slightly to strongly effervescent to a depth of 30 to 45 inches and noneffervescent to strongly effervescent below

This pedon is a taxadjunct to the series because it has lime filaments in the lower part of the soil profile. The Tweba series lacks visible secondary lime in the profile. Use and management are the same.

## Umberland Series

The Umberland Series consists of very deep, somewhat poorly drained soils that formed in silty lacustrine sediments derived from mixed rock sources. Umberland soils are on lake plains, alluvial flats, and lake plain terrace remnants. Slopes are 0 to 2 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine, montmorillonitic (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Umberland silt loam, occasionally flooded, in an area of the Skullwak-Umberland-Wendane association:

A—0 to 4 inches; light gray (10YR 7/2) silt loam, dark brown (10YR 4/3) moist; massive; hard, friable, nonsticky and nonplastic; few very fine roots; many very fine vesicular pores; strongly effervescent;

strongly alkaline (pH 9.0); abrupt smooth boundary. (1 to 4 inches thick)

C1—4 to 12 inches; very pale brown (10YR 7/3) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure parting to moderate fine angular blocky; slightly hard, very friable, very sticky and very plastic; common very fine and fine roots; many very fine interstitial pores; strongly effervescent; very strongly alkaline (pH 9.6); clear smooth boundary. (2 to 8 inches thick)

C2—12 to 19 inches; light gray (5Y 7/2) silty clay, olive (5Y 5/4) moist; few medium faint dark brown (7.5YR 4/4 moist) mottles; moderate fine angular blocky structure; slightly hard, very friable, very sticky and very plastic; few fine and medium roots; common very fine tubular and interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 24 inches thick)

C3—19 to 31 inches; light gray (5Y 7/2) silty clay loam, olive (5Y 5/3) moist; common medium prominent dark brown (7.5YR 4/4 moist) mottles; moderate fine angular blocky structure; slightly hard, very friable, very sticky and very plastic; few fine roots; common very fine tubular and interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 18 inches thick)

Ck—31 to 60 inches; olive (5Y 5/3) silty clay, olive gray (5Y 5/2) moist; common medium prominent dark brown (7.5YR 4/4 moist) mottles; massive; slightly hard, friable, very sticky and very plastic; very few fine roots; few very fine tubular pores; strongly effervescent; few fine lime concretions; strongly alkaline (pH 8.8).

**Type location:** Lander County, Nevada; 30 miles south of Battle Mountain, in an unsectioned area, approximately 2,100 feet west and 2,100 feet south of the assumed northeast corner of sec. 34, T. 24 N., R. 47 E.

### Range in Characteristics

*Soil moisture:* Saturated in some horizon at a depth of 20 to 40 inches for at least a month during most years and the capillary fringe moistens the soil to within 6 inches of the surface

*Soil temperature:* 47 to 52 degrees F

*Secondary carbonates:* Concretions or nodules at a depth of 15 to 35 inches

*Control section:* Clay content—35 to 50 percent; texture—silty clay loam or silty clay, strata of clay in some pedons

*Salt and sodium:* Strongly saline-alkali in the upper part of the profile, concentrations generally decreasing with depth

**A horizon:**

Hue—10YR, 2.5Y, or 5Y

Value—6, 7, or 8 dry, 4, 5, or 6 moist

Chroma—2, 3, or 4

Structure—strong very fine or fine granular (due to flocculation); massive in some pedons

**C horizon:**

Hue—2.5Y or 5Y

Value—6, 7, or 8 dry, 4, 5, or 6 moist

Chroma—2, 3, or 4

Reaction—strongly alkaline or very strongly alkaline, usually becoming less alkaline with depth

**Unsel Variant**

The Unsel Variant consists of moderately deep, well drained soils that formed in residuum and colluvium weathered from tuffaceous sediments. Unsel Variant soils are on side slopes of fan piedmonts underlain by tertiary sediments. Slopes are 30 to 50 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Haplargids

**Typical pedon:** Unsel Variant very gravelly loam, 30 to 50 percent slopes, in an area of the Grassval-Grina-Unsel Variant association. Pebbles cover about 45 percent and cobbles 15 percent of the soil surface:

**A**—0 to 2 inches; light gray (10YR 7/2) very gravelly loam, brown (10YR 5/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and nonplastic; few fine roots; common very fine and few fine vesicular pores; 40 percent pebbles; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 4 inches thick)

**BA**—2 to 4 inches; light gray (10YR 7/2) very gravelly clay loam, brown (10YR 5/3) moist; strong thin platy structure; slightly hard, friable, sticky and plastic; few fine and very fine roots; common fine vesicular and few very fine tubular pores; 30 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 4 inches thick)

**Bt**—4 to 11 inches; pale brown (10YR 6/3) gravelly clay loam, dark brown (10YR 4/3) moist; common white (10YR 8/2) bleached faces of peds concentrated in the lower part; strong medium angular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; common thin and moderately thick clay films on peds; 20 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (5 to 13 inches thick)

**Btk**—11 to 15 inches; very pale brown (10YR 7/3) gravelly clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; common very fine and fine tubular pores; many thin and common moderately thick clay films on peds; 25 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (4 to 10 inches thick)

**Bqk**—15 to 22 inches; very pale brown (10YR 7/3) gravelly loam, brown (10YR 5/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few very fine tubular pores; 30 percent medium durinodes; few thin silica pendants on undersides of rock fragments; 25 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (6 to 12 inches thick)

**Cr**—22 to 46 inches; soft tuff.

**Type location:** Lander County, Nevada; approximately 36 miles south of Battle Mountain, about 300 feet south and 1,400 feet west of the northeast corner of sec. 22, T. 26 N., R. 46 E.

**Range in Characteristics**

**Soil moisture:** Usually dry, moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to soft bedrock:** 20 to 40 inches

**Control section:** Clay content—27 to 35 percent; rock fragments—20 to 30 percent when mixed, mainly pebbles

**Reaction throughout the profile:** Moderately alkaline to very strongly alkaline, becoming more alkaline with depth

**A horizon:**

Hue—10YR or 2.5Y

Chroma—2 to 4

**Bt horizon:**

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Exchangeable sodium—less than 5 percent in the Bt horizon, 5 to 15 percent in the Btk horizon

**Bqk horizon:**

Hue—10YR or 2.5Y

Value—6 to 8 dry, 5 or 6 moist

Chroma—2 to 4

Texture—loam or sandy loam

Rock fragments—20 to 35 percent when mixed, mainly pebbles

Cementation—20 to 50 percent durinodes or weak discontinuous silica cementation

## Valmy Series

The Valmy series consists of very deep, well drained soils that formed in a thin loess cap that contains high amounts of volcanic ash and that overlies loamy alluvium. Valmy soils are on inset fans and fan skirts. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Durorthidic Torriorthents

**Typical pedon:** Valmy very fine sandy loam, silty substratum, 0 to 2 percent slopes, in an area of the Batan-Wendane-Valmy association:

- A1—0 to 3 inches; light brownish gray (10YR 6/2) very fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; many very fine vesicular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 4 inches thick)
- A2—3 to 6 inches; light brownish gray (10YR 6/2) very fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; common very fine tubular pores; 5 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (0 to 4 inches thick)
- C—6 to 18 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; common fine roots; few fine tubular pores; 10 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.2); gradual wavy boundary. (6 to 12 inches thick)
- Cqk—18 to 29 inches; pale brown (10YR 6/3) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; common fine roots; few very fine tubular pores; 40 percent 3- to 30-millimeter, hard, firm durinodes; 5 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.4); gradual wavy boundary. (8 to 14 inches thick)
- Ck—29 to 46 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, light olive brown (2.5Y 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; common fine roots; few very fine tubular pores; 5 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (7 to 17 inches thick)
- 2Cqk—46 to 60 inches; light brownish gray (2.5Y 6/2)

silty clay loam, olive brown (2.5Y 4/4) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 90 percent weak discontinuous cementation; strongly effervescent; strongly alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 33 miles southeast of Battle Mountain, approximately 2,300 feet north and 300 feet west of the southeast corner of sec. 7, T. 27 N., R. 48 E.

### Range in Characteristics

**Soil moisture:** Usually dry, moist for short periods in winter and spring

**Soil temperature:** 47 to 53 degrees F

**Depth to Cq horizon:** 8 to 20 inches

**Durinodes:** 5 to 85 percent by volume in any one horizon, but one or more horizons more than 6 inches thick contain more than 25 percent

**Depth to unconformable material:** 30 to 50 inches, but in some pedons more than 50 inches to sandy material

**Control section:** Texture—mainly fine sandy loam or sandy loam, but includes strata of very fine sandy loam or coarse sandy loam in some pedons; clay content—5 to 15 percent; rock fragments—0 to 30 percent, mainly pebbles

#### A horizon:

Hue—10YR or 2.5Y

Value—5 or 6 dry, 3 or 4 moist

Reaction—Moderately alkaline or strongly alkaline

#### C horizon:

Hue—10YR or 2.5Y

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 to 4

Consistence—hard to extremely hard, firm or very firm and brittle

Reaction—strongly alkaline or very strongly alkaline

Carbonates—effervescent to violently effervescent

#### 2C horizon:

Texture—gravelly sand or very gravelly sand, silty clay loam below a depth of 40 inches in substratum phases

Clay content—1 to 5 percent

Rock fragments—20 to 55 percent

Reaction—Strongly or very strongly alkaline

## Vanwyper Series

The Vanwyper series consists of moderately deep, well drained soils that formed in residuum and colluvium weathered from sedimentary and volcanic rock sources. Vanwyper soils are on side slopes of mountains. Slopes

are 15 to 50 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic Xerollic Haplargids

**Typical pedon:** Vanwyper cobbly loam, 15 to 50 percent slopes, in an area of the Vanwyper-Trunk-Trunk, steep, association. Pebbles cover 10 percent and cobbles 10 percent of the soil surface:

A1—0 to 2 inches; light brownish gray (10YR 6/2) cobbly loam, dark grayish brown (10YR 4/2) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine vesicular pores; 5 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 5 inches thick)

A2—2 to 7 inches; pale brown (10YR 6/3) cobbly loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, sticky and slightly plastic; many very fine and few fine roots; common very fine tubular pores; 5 percent pebbles, 10 percent cobbles; common thin clay films on faces of peds and lining pores; mildly alkaline (pH 7.7); gradual smooth boundary. (4 to 8 inches thick)

Bt1—7 to 9 inches; yellowish brown (10YR 5/4) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and few fine roots; common very fine tubular pores; common thin clay films on peds and lining pores; 10 percent pebbles, 30 percent cobbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (0 to 8 inches thick)

Bt2—9 to 18 inches; light yellowish brown (10YR 6/4) very cobbly clay, yellowish brown (10YR 5/4) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, firm, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds, lining pores, and coating rock fragments; few fine lime coatings on underside of coarse fragments; 10 percent pebbles 35 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary. (6 to 20 inches thick)

Bt3—18 to 22 inches; light yellowish brown (10YR 6/4) very cobbly clay, yellowish brown (10YR 5/4) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; hard, firm, sticky and plastic; common very fine and fine and few medium roots; few tubular pores; many moderately thick clay films on faces of peds, lining pores, and coating rock fragments; few fine lime coatings on

undersides of coarse fragments; 10 percent pebbles, 35 percent cobbles; slightly effervescent; mildly alkaline (pH 7.8); abrupt wavy boundary. (0 to 12 inches thick)

2R—22 inches; fractured rhyolite.

**Type location:** Lander County, Nevada; about 23 miles north of Battle Mountain, approximately 2,200 feet north and 2,400 feet east of the southwest corner of sec. 35, T. 36 N., R. 45 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 50 degrees F

*Solum thickness and depth to bedrock:* 20 to 40 inches

*Control section:* Texture—very cobbly clay loam and very cobbly clay; clay content—35 to 55 percent; rock fragments—36 to 60 percent dominated by cobbles

*Reaction throughout the profile:* Neutral or mildly alkaline

*A horizon:*

Value—3 or 4 moist

Chroma—2, 3, or 4

Structure—weak to strong, very thin to medium platy or very fine to medium subangular blocky

*Bt horizon:*

Hue—10YR, 7.5YR, or 5YR

Value—4 to 6 dry, 3 to 5 moist

Chroma—3 or 4

Structure—angular or subangular blocky in the upper part, prismatic in the lower part

Other features—a thin coating of carbonates on the undersides of rock fragments in some pedons

#### Veta Series

The Veta series consists of very deep, well drained soils that formed in alluvium of mixed rock sources. Veta soils are on inset fans. Slopes are 0 to 8 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Xerollic Camborthids

**Typical pedon:** Veta very gravelly fine sandy loam, 2 to 8 percent slopes, in an area of the Oxcorel-Rednik-Veta association. Pebbles cover 25 percent and cobbles 5 percent of the soil surface:

A—0 to 4 inches; light brownish gray (10YR 6/2) very gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate thin and medium platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine



vesicular and few fine tubular pores; 35 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 9 inches thick)

Bw1—4 to 11 inches; light yellowish brown (10YR 6/4) very gravelly loam, brown (10YR 4/3) moist; moderate very fine and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine and few fine tubular pores; 50 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (6 to 16 inches thick)

Bw2—11 to 20 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak very fine and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; common very fine tubular pores; 70 percent pebbles, 10 percent cobbles; slightly effervescent in spots; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 10 inches thick)

C—20 to 30 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores; 65 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.2); clear smooth boundary. (8 to 24 inches thick)

Ck1—30 to 36 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; many very fine and common fine tubular pores; 55 percent pebbles; thin (less than 2 millimeter) lime coatings on undersides of rock fragments; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 10 inches thick)

Ck2—36 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine interstitial pores; 65 percent pebbles, 10 percent cobbles; thin (less than 1 millimeter) lime coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; about 7 miles south of Battle Mountain, approximately 1,500 feet north and 50 feet west of the southeast corner of sec. 11, T. 29 N., R. 47 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-June through October

**Soil temperature:** 50 to 53 degrees F

**Combined thickness of A and Bw horizons:** 12 to 20 inches

**Depth to carbonates:** 28 to 40 inches

**Control section:** Texture—very gravelly or extremely gravelly loam, sandy loam, or coarse sandy loam; clay content—5 to 15 percent; rock fragments—35 to 75 percent, mainly pebbles

**Reaction throughout the profile:** Neutral to moderately alkaline

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—platy; massive in some pedons

#### Bw horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Structure—subangular blocky; massive in some pedons

#### C horizon:

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 or 3, may be 4 in Ck horizon

Carbonates—slightly effervescent to strongly effervescent in the lower subhorizon

Other features—thin strata of loamy sand or loamy coarse sand in lower subhorizons of some pedons

### Walti Series

The Walti series consists of moderately deep, well drained soils that formed in colluvium and residuum of weathered rhyolite, andesite, dacite, tuffs, and quartzite. Walti soils are on crests and side slopes of mountains. Slopes are 8 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Walti extremely cobbly loam, 30 to 50 percent slopes, in an area of the Walti-Softscrabble-Bucan association, in Lander County, south part. Pebbles cover 20 percent and cobbles and stones 40 percent of the soil surface:

A—0 to 4 inches; grayish brown (10YR 5/2) extremely cobbly loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine vesicular pores; 35 percent pebbles, 25 percent cobbles; neutral (pH 6.8); clear smooth boundary. (4 to 10 inches thick)

Bt1—4 to 10 inches; brown (7.5YR 5/2) gravelly clay

loam, dark brown (7.5YR 3/2) moist; moderate fine angular structure; hard, friable, sticky and plastic; common very fine and fine and few medium and coarse roots; common very fine and fine tubular pores; common thin clay films on peds; 15 percent pebbles, 5 percent cobbles; neutral (pH 7.0); abrupt wavy boundary. (2 to 7 inches thick)

**2Bt2**—10 to 24 inches; brown (10YR 5/3) clay, dark brown (7.5YR 3/4) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, firm, very sticky and very plastic; few very fine and fine roots along faces of peds; common very fine and fine tubular pores; common moderately thick clay films on faces of peds; 10 percent pebbles; neutral (pH 7.0); gradual wavy boundary. (6 to 14 inches thick)

**2Bt3**—24 to 30 inches; pinkish gray (7.5YR 6/2) clay, dark brown (7.5YR 4/2) moist; weak medium prismatic structure; very hard, firm, very sticky and very plastic; few fine roots; few very fine and fine tubular pores; common thin clay skins on faces of peds; 10 percent pebbles; neutral (pH 7.0); abrupt wavy boundary. (5 to 8 inches thick)

**3R**—30 inches; fractured andesite.

**Type location:** Lander County, Nevada, south part; about 17 miles west of Austin, approximately 1,300 feet east and 2,275 feet south of the northwest corner of sec. 14, T. 20 N., R. 46 E. (part of the BLM private contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from late June to mid-October

**Soil temperature:** 44 to 46 degrees F

**Mollic epipedon thickness:** 7 to 12 inches, commonly includes upper part of the argillic horizon

**Depth to bedrock:** 20 to 30 inches

**Control section:** Clay content—40 to 50 percent; rock fragments—5 to 25 percent, mainly pebbles

**Reaction throughout the profile:** Neutral or mildly alkaline

#### A horizon:

Value—4 or 5 dry

Chroma—2 or 3

#### Bt horizon:

Hue—10YR or 7.5YR

Value—4 or 5 dry, 3 or 4 moist. Some pedons are 6 dry in the lower subhorizon above the bedrock

Chroma—2 to 4

Texture—clay loam or gravelly clay loam that is 27 to 35 percent clay and that has an abrupt lower boundary in the upper subhorizon; clay or gravelly clay that is 50 to 60 percent clay in the lower subhorizon

Rock fragments—5 to 25 percent, mostly pebbles and cobbles

Structure—prismatic or angular blocky

### Welch Series

The Welch series consists of very deep, poorly drained soils that formed in alluvium of some vitric pyroclastic materials but mainly in mixed volcanic rock sources. Welch soils are on flood plains and inset fans in narrow hill and mountain valley drainageways. Slopes are 2 to 8 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Cumulic Haplaquolls

**Typical pedon:** Welch loam, drained, 2 to 8 percent slopes:

**A1**—0 to 2 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; many very fine roots; many very fine interstitial pores; neutral (pH 7.2); abrupt smooth boundary. (2 to 15 inches thick)

**A2**—2 to 4 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine interstitial pores; neutral (pH 6.8); abrupt smooth boundary. (2 to 14 inches thick)

**A3**—4 to 26 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; few fine distinct reddish yellow (7.5YR 6/6) mottles; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; many very fine and fine and common medium roots; common very fine, fine, and coarse tubular pores; 10 percent pebbles; neutral (pH 6.8); clear smooth boundary. (8 to 22 inches thick)

**AC**—26 to 30 inches; light brownish gray (10YR 6/2) clay loam, very dark grayish brown (10YR 3/2) moist; common large distinct reddish yellow (7.5YR 6/6) mottles; moderate medium and coarse subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; many very fine and common coarse tubular pores; slightly effervescent; mildly alkaline (pH 8.0); clear smooth boundary. (0 to 18 inches thick)

**C**—30 to 40 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; common large distinct reddish yellow (7.5YR 6/6) mottles; weak medium and coarse subangular

blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine roots; many very fine and few coarse tubular pores; mildly alkaline (pH 7.6); abrupt smooth boundary. (5 to 15 inches thick)

**Ab**—40 to 60 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; common large distinct reddish yellow (7.5YR 6/6) mottles; moderate medium and coarse prismatic structure; hard, friable, sticky and plastic; common very fine and fine and few medium roots; many very fine and few medium and coarse tubular pores; mildly alkaline (pH 7.6).

**Type location:** Lander County, Nevada; about 22 miles southeast of Battle Mountain, approximately 500 feet south and 1,200 feet west of the northeast corner of sec. 34, T. 29 N., R. 46 E.

#### Range in Characteristics

**Soil moisture:** Saturated at or near the surface for at least 1 month during most years, mainly in late winter and early spring; at a depth of 18 to 36 inches from early spring through September; drained phases recognized

**Soil temperature:** 42 to 46 degrees F

**Mollic epipedon thickness:** 26 to more than 60 inches, organic matter content decreasing irregularly with increasing depth

**Control section:** Clay content—27 to 35 percent when mixed; texture—dominantly sandy clay loam or clay loam; mineralogy—mixed, but the parent material has a large component of vitric pyroclastic materials

**Other features:** Buried A horizon; gravelly strata or strata of silty clay loam, silt loam, clay, loam, very fine sandy loam, or sandy loam in some pedons

#### A horizon:

Hue—10YR to 5Y or neutral

Value—3 to 5 dry, 2 or 3 moist

Chroma—0, 1, 2, or 3 in the upper part and 0, 1, or 2 in the lower part

Structure—weak to strong, thin or medium platy; weak or moderate, very fine to medium prismatic, granular, or subangular blocky; massive in some pedons that have a deeper A horizon

Consistence—soft to hard dry, very friable or friable moist, nonsticky to sticky and slightly plastic to plastic wet

Reaction—slightly acid or neutral

Other features—some pedons have high chroma, yellowish hue iron mottles

#### C horizon:

Hue—10YR, 5Y to 5B, or neutral

Value—5 to 8 dry, 3 to 5 moist

Chroma—0, 1, or 2

Reaction—slightly acid to mildly alkaline

Mottles—high chroma iron mottles in many pedons

This pedon is a taxadjunct to the Welch series because it has a C horizon that has hue of 10YR and chroma of 2 and has a subhorizon in the A horizon that is typically mildly alkaline. The Welch series typically has a Cq horizon below the mollic epipedon. The Cq horizon has hue of 5Y to 5B or is neutral in hue. It has chroma of 0 or 1. The Welch series also typically has an A horizon that is slightly acid or neutral. Use and management are the same.

### Wendane Series

The Wendane series consists of very deep, somewhat poorly drained soils that formed in silty alluvium derived from volcanic rocks, tuff, loess, and volcanic ash. Wendane soils are on alluvial flats. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Wendane silt loam, frequently flooded:

**A1**—0 to 3 inches; light gray (10YR 7/1) silt loam, grayish brown (10YR 5/2) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and plastic; few very fine roots; many very fine vesicular and tubular pores; strongly effervescent; very strongly alkaline (pH 9.8); abrupt smooth boundary. (1 to 6 inches thick)

**A2**—3 to 8 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderate very thin and thin platy structure; hard, very friable, sticky and plastic; few very fine and fine roots; many very fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.6); clear wavy boundary. (0 to 9 inches thick)

**C**—8 to 13 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; massive; hard, very friable, sticky and plastic; common very fine and few fine and medium roots; many very fine and few fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.6); clear wavy boundary. (5 to 16 inches thick)

**Cqk1**—13 to 19 inches; white (10YR 8/2) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, sticky and plastic; common very fine and few fine and medium roots; many very fine and few fine tubular pores; 20 percent weak, 10- to 30 millimeter

durinodes; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 30 inches thick)

**Cqk2**—19 to 27 inches; white (10YR 8/1) very fine sandy loam (volcanic ash), light gray (10YR 7/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and fine tubular pores; 20 percent weak, 5- to 20-millimeter durinodes; 20 percent weak discontinuous silica cementation; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (0 to 17 inches thick)

**Ck**—27 to 40 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; common fine distinct strong brown (7.5YR 5/6) mottles, brown (7.5YR 4/4) moist; massive; hard, friable, sticky and plastic; few very fine roots; many very fine and common fine tubular pores; continuous thin clay films lining pores; slightly effervescent; few fine filaments of secondary carbonates; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 22 inches thick)

**Ab**—40 to 48 inches; light gray (10YR 6/1) silty clay loam, very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) moist; massive; hard, friable, sticky and very plastic; few very fine roots; many very fine and few fine and medium tubular pores; continuous thin clay films lining pores; few snail shells; slightly effervescent; strongly alkaline (pH 8.6); clear irregular boundary. (0 to 11 inches thick)

**C'**—48 to 65 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; massive; hard, friable, sticky and very plastic; few very fine roots; many very fine and few fine tubular pores; continuous thin clay films lining pores; 15 percent fine and medium pebbles; slightly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; approximately 4 miles north of Battle Mountain, about 2,500 feet north and 1,000 feet east of the southwest corner of sec. 32, T. 33 N., R. 45 E.

#### Range in Characteristics

**Soil moisture:** Saturated within a depth of 28 to 40 inches in spring of most years; dry mid-summer through mid-winter, moist in mid-winter, spring, and early summer; apparent seasonal high water table at a depth of 2.5 to 4.0 feet from February to July; drained phases recognized

**Soil temperature:** 47 to 52 degrees F

**Mineralogy:** Mixed, but has a strong influence from volcanic ash and other pyroclastic materials

**Depth to Cqk horizon:** 11 to 20 inches

**Depth to high chroma mottles:** 13 to 27 inches

**Control section:** Clay content—20 to 30 percent when mixed; texture—silt loam or silty clay loam, when averaged, that is less than 15 percent fine sand and coarser particles

**Salts:** Normally strongly saline in the upper part of the profile and nonsaline to slightly saline in the lower part

**Exchangeable sodium:** 15 to 70 percent in half or more of the uppermost 20 inches, the degree decreasing with depth

**Profile reaction:** Moderately alkaline to very strongly alkaline

**Other features:** Unconformable; stratified gravelly sand or very gravelly sand in some pedons below a depth of 40 inches

#### A horizon:

Value—6 or 7 dry, 4 to 6 moist

Chroma—1 to 4

Structure—very thin to thick platy or fine granular; massive in some pedons

Consistence—very friable to firm moist, slightly sticky to very sticky and slightly plastic to very plastic wet

#### C and Cqk horizons:

Hue—10YR or 2.5Y

Value—6 to 8, 4 to 7 moist

Chroma—1 to 4

Texture—very fine sandy loam, silt loam, silty clay loam, and clay loam

Other features—strata of volcanic ash 4 to 10 inches thick at a depth of 13 to 36 inches

#### Cqk horizon:

Thickness—13 to more than 30 inches, when combined

Cementation—20 to 35 percent weakly or strongly cemented durinodes in a friable matrix and as much as 30 percent weak discontinuous silica cementation in any one horizon

### Wendane Variant

The Wendane Variant consists of very deep, poorly drained soils that formed in loess, volcanic ash, and alluvium derived from mixed rock sources. Wendane Variant soils are on basin floor remnants. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Wendane Variant silt loam:

- A1—0 to 5 inches; grayish brown (10YR 5/2) silt loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; common very fine tubular pores; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (4 to 10 inches thick)
- A2—5 to 10 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; few fine distinct yellowish brown (10YR 5/4 moist) mottles; weak fine and medium subangular blocky structure; hard, friable, sticky and plastic; common very fine, fine, and medium roots; many very fine tubular pores; violently effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (4 to 10 inches thick)
- Bqk—10 to 18 inches; white (10YR 8/1) gravelly silt loam, light yellowish brown (2.5Y 6/4) moist; common fine distinct yellowish brown (10YR 5/4 moist) mottles; massive; hard, friable, sticky and plastic; few very fine, fine, and medium roots; many very fine tubular pores; 25 percent pebbles; 30 percent weak to strong durinodes; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (4 to 12 inches thick)
- 2Cqk—18 to 29 inches; white (10YR 8/2) very gravelly loam, light yellowish brown (2.5Y 6/4) moist; many medium and coarse distinct yellowish brown (10YR 5/6 moist) mottles; few coarse prominent very dark grayish brown (10YR 3/2 moist) iron and manganese stains; massive; hard, friable, sticky and plastic; few very fine roots; common very fine interstitial and tubular pores; 35 percent pebbles; 10 percent weak durinodes; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary. (0 to 15 inches thick)
- 2Cq—29 to 60 inches; very pale brown (10YR 7/3) very gravelly loam, olive brown (2.5Y 4/4) moist; common medium distinct light yellowish brown (2.5Y 6/4 moist) and many medium prominent yellowish brown (10YR 5/8 moist) mottles; massive; hard, friable, sticky and plastic; few very fine roots; common very fine interstitial and tubular pores; 45 percent pebbles; 20 percent weak discontinuous silica cementation; violently effervescent; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; approximately 35 miles northeast of Austin, about 1,400 feet south and 1,500 feet west of the northeast corner of sec. 8, T. 23 N., R. 48 E.

**Range in Characteristics**

**Soil moisture:** Dry mid-summer through mid-winter,

moist in mid-winter, spring, and early summer; apparent seasonal high water table between depths of 1.5 and 2.5 feet from February to June

**Soil temperature:** 47 to 52 degrees F

**Depth to durinodes:** 10 to 20 inches

**Depth to weak discontinuous silica cementation:** 20 to 30 inches

**Control section:** Clay content—18 to 27 percent when mixed; rock fragments—35 to 45 percent when mixed, mainly pebbles

**Other features:** Normally strongly saline and moderately sodic, the degree decreasing with depth

**Weso Series**

The Weso series consists of very deep, well drained soils that formed in alluvium of mixed rock sources and in a loess mantle that has high amounts of volcanic ash. Weso soils are on fan skirts. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Duric Camborthids

**Typical pedon:** Weso fine sandy loam:

- A—0 to 5 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; strong thin and medium platy structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine random roots; many very fine vesicular and common very fine tubular pores; strongly alkaline (pH 8.6); abrupt wavy boundary. (1 to 5 inches thick)
- Bw—5 to 11 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine random and few fine oblique and vertical roots; many very fine tubular and common very fine interstitial pores; strongly alkaline (pH 8.6); abrupt smooth boundary. (6 to 15 inches thick)
- Bqk1—11 to 14 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 4/3) moist; weak medium and thick platy structure; hard, firm, slightly sticky and slightly plastic; few very fine random and very few fine oblique and vertical roots; common very fine tubular pores; common medium lime coatings on faces of peds; weak silica cementation; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (1 to 14 inches thick)
- Bqk2—14 to 29 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft,

very friable, slightly sticky and slightly plastic; many very fine random and few fine and medium oblique and horizontal roots; common very fine tubular pores; 30 percent 10- to 30-millimeter, weak durinodes; few fine and medium lime filaments and threads; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (8 to 17 inches thick)

**Bk1**—29 to 36 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine random and very few fine oblique roots; common very fine tubular pores; few weak durinodes; few fine lime and gypsum filaments and threads; strongly effervescent; moderately alkaline (pH 8.6); clear wavy boundary. (0 to 13 inches thick)

**Bk2**—36 to 42 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and slightly plastic; few very fine and fine random roots; many very fine tubular pores; few fine lime and gypsum filaments and threads; strongly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (0 to 13 inches thick)

**Cqk**—42 to 60 inches; very pale brown (10YR 7/3) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; very few very fine random roots; common very fine tubular pores; 30 percent 15- to 30-millimeter, weak durinodes; few fine lime and gypsum filaments and threads; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; about 7 miles northwest of Battle Mountain, approximately 530 feet west and 1,320 feet north of the southeast corner of sec. 28, T. 33 N., R. 44 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist for short periods in winter and spring

**Soil temperature:** 47 to 53 degrees F

**Depth to base of Bw horizon and silica cementation:** 10 to 18 inches

**Control section:** Clay content—5 to 15 percent; rock fragments—0 to 25 percent, mainly pebbles; texture—dominantly fine sandy loam, very sandy loam, or loam; minor strata of sandy loam, coarse sandy loam, or silt loam in some pedons

**Other features:** Underlying skeletal material below a depth of 40 inches in some pedons

#### A horizon:

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 or 3

Reaction—Moderately alkaline to very strongly alkaline

#### Bw horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Reaction—moderately alkaline to very strongly alkaline

Other features—noncalcareous

#### Bqk horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Cementation—ranges from continuously weakly silica cemented to several weakly cemented plates up to 1 inch thick, slightly weaker cemented or friable material between plates; durinodes in a friable matrix in some pedons

Reaction—moderately alkaline to very strongly alkaline

#### C horizon:

Texture—very gravelly loamy sand to fine sandy loam

Rock fragments—averages 10 to 20 percent

Reaction—strongly alkaline or very strongly alkaline

Carbonates—these horizons are noneffervescent to violently effervescent

This pedon is a taxadjunct to the Weso series because it lacks unconformable layers within a depth of 40 inches. The Weso series typically have an unconformable 2Bk horizon within a depth of 40 inches. Use and management are the same.

### Whirlo Series

The Whirlo series consists of very deep, well drained soils that formed mainly in mixed alluvium and in some loess. Whirlo soils are on inset fans, fan aprons, and fan skirts. Slopes are 0 to 15 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Camborthids

**Typical pedon:** Whirlo silt loam, 0 to 2 percent slopes:

**A1**—0 to 4 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine random roots; many very fine and few fine vesicular pores; 5 percent pebbles; very slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (1 to 6 inches thick)

A2—4 to 7 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and plastic; common very fine random and very few fine oblique roots; common very fine vesicular and tubular pores; 5 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (1 to 6 inches thick)

Bw—7 to 12 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; many very fine random and very few fine oblique roots; common very fine and few fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary. (4 to 10 inches thick)

2Bkq—12 to 24 inches; very pale brown (10YR 7/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine random and very few fine oblique roots; common very fine tubular pores; 35 percent pebbles; 10 percent weak, 10- to 30-millimeter durinodes; few fine lime filaments and thin pebble coatings; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 12 inches thick)

2Bk—24 to 60 inches; variegated extremely gravelly coarse sandy loam; single grained; loose, nonsticky and slightly plastic; common very fine random roots; 5 percent cobbles, 70 percent pebbles; lime coatings on 50 percent of pebble surfaces; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada; about 11 miles southeast of Battle Mountain, approximately 1,900 feet west and 1,450 feet north of the southeast corner of sec. 29, T. 31 N., R. 46 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-May through November

**Soil temperature:** 47 to 53 degrees F

**Depth to 2Bk horizon:** 10 to 20 inches

**Control section:** Clay content—5 to 15 percent; rock fragments—35 to 70 percent, mainly pebbles

#### A horizon:

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak or moderate, thin to thick platy; massive in some pedons

Reaction—neutral to moderately alkaline

#### Bw horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—gravelly sandy loam, fine sandy loam, very fine sandy loam, silt loam, or gravelly loam

Rock fragments—0 to 30 percent pebbles

Structure—weak or moderate, fine or medium subangular blocky; weak coarse prismatic; massive in some pedons

Reaction—neutral to moderately alkaline

#### 2Bk horizon:

Hue—10YR or 2.5Y

Value—6 to 8 dry, 3 to 6 moist

Chroma—2 or 3

Texture—very gravelly loam to extremely gravelly coarse sandy loam

Rock fragments—35 to 75 percent, mainly pebbles but some cobbles and stones

Reaction—moderately alkaline or strongly alkaline

Carbonates—slightly to violently effervescent

Other features—up to 10 percent weak durinodes in some pedons

### Wholan Series

The Wholan series consists of very deep, well drained soils that formed in a loess mantle over silty alluvium derived from mixed rock sources. Wholan soils are on inset fans and fan skirts. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-silty, mixed, mesic Typic Camborthids

**Typical pedon:** Wholan silt loam, 0 to 2 percent slopes, in an area of the McConnel-Rasille-Wholan association, in Lander County, Nevada, south part:

A—0 to 5 inch; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine tubular pores; mildly alkaline (pH 7.8); abrupt smooth boundary. (1 to 6 inches thick)

Bw—5 to 13 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular pores; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 20 inches thick)

Bk—13 to 21 inches; white (10YR 8/2) very fine sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine

tubular pores; few fine lime filaments or threads; strongly effervescent; strongly alkaline (pH 8.5); clear smooth boundary. (4 to 15 inches thick)

**C**—21 to 25 inches; white (10YR 8/2) very fine sandy loam, light brownish gray (10YR 6/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (4 to 20 inches thick)

**Cq**—25 to 60 inches; light gray (10YR 7/2) very fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular pores; 5 percent weakly cemented durinodes; strongly effervescent; very strongly alkaline (pH 9.2).

**Type location:** Lander County, Nevada, south part; about 21 miles west of Austin, approximately 1,200 feet south and 400 feet west of the northeast corner of sec. 1, T. 18 N., R. 39 E. (part of the BLM contract survey completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from late May through October

**Soil temperature:** 47 to 53 degrees F

**Depth to Bk horizon:** 11 to 24 inches

**Control section:** Clay content—5 to 15 percent; texture—silt loam, very fine sandy loam that has thin strata of loam or fine sandy loam in some pedons

**Reaction throughout the profile:** Mildly alkaline to very strongly alkaline, becoming more alkaline with depth

**Salt and sodium:** Free of salt and sodium or slightly salt and sodium affected to a depth of 30 inches and moderately or strongly affected below this depth

**Other features:** Thin strata of 5 percent  $\frac{1}{2}$  to  $\frac{3}{4}$  inch, very hard, firm, brittle durinodes in the C horizon of some pedons

#### A horizon:

Value—5 to 7 dry, 3 to 5 moist (5 dry and 3 moist in the A1 horizon only, where present)

Chroma—2 to 4

Structure—weak or moderate, very thin to medium platy; coarse subangular blocky; massive in some pedons

Consistence—soft or slightly hard

Carbonates—noneffervescent or slightly effervescent

#### Bw horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—weak, fine to coarse subangular blocky; medium or coarse prismatic; massive in some pedons

#### Bk and C horizons:

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Carbonates—few to many, fine or medium veins and soft masses of lime in the Bk horizon; C horizon lacks segregated lime

Durinodes—up to 5 percent in some substrata of some pedons

### Wieland Series

The Wieland series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources, loess, and volcanic ash. Wieland soils are on summits and side slopes of fan piedmont remnants. Slopes are 2 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Durixerollic Haplargids

**Typical pedon:** Wieland gravelly loam, 4 to 15 percent slopes, in an area of the Allor-Wieland association, in Lander County, south part. Pebbles cover 20 percent of the soil surface:

**A1**—0 to 5 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 8 inches thick)

**A2**—5 to 8 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial pores; 5 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary. (0 to 6 inches thick)

**Bt1**—8 to 14 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium angular blocky; hard, friable, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; few thin clay films on faces of peds; 15 percent pebbles; mildly alkaline (pH 7.6); gradual wavy boundary. (0 to 6 inches thick)

**Bt2**—14 to 20 inches; yellowish brown (10YR 5/4) gravelly clay, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to



strong medium angular blocky; hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; many moderately thick and few thick clay films on faces of peds; common silica and lime pendants on undersides of rock fragments; 30 percent pebbles; few fine irregular seams of secondary carbonates; slightly effervescent; moderately alkaline (pH 8.0); gradual smooth boundary. (2 to 10 inches thick)

**Bqk1**—20 to 25 inches; very pale brown (10YR 7/4) very gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; very hard, firm, slightly sticky and slightly plastic; few fine roots; few very fine and fine tubular pores; 40 percent weak discontinuous silica cementation; many silica and lime pendants on undersides of rock fragments; 50 percent pebbles, 5 percent cobbles; common fine irregular seams of secondary carbonates; violently effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (0 to 6 inches thick)

**Bqk2**—25 to 44 inches; very pale brown (10YR 8/4) gravelly loam, light yellowish brown (10YR 6/4) moist; massive; very hard, very firm, slightly sticky and slightly plastic; few fine roots; few very fine tubular pores; 20 percent 5- to 25-millimeter, strongly cemented durinodes, mostly in few thin interlayered strata of noncemented material; 25 percent pebbles; weak continuous silica cementation; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (5 to 19 inches thick)

**Cqk**—44 to 60 inches; light gray (10YR 7/2) gravelly loam, brown (10YR 5/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine tubular pores; 15 percent pebbles; weak continuous silica cementation; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada, south part; about 8 miles northeast of Austin, approximately 800 feet east and 750 feet north of the southwest corner of sec. 21, T. 20 N., R. 45 E. (part of the BLM contract completed in Lander County)

#### Range in Characteristics

**Soil moisture:** Usually dry, moist from late October through early June

**Soil temperature:** 47 to 52 degrees F

**Depth to weak continuous silica cementation:** 19 to 30 inches

**Depth to base of Bt horizon:** 19 to 30 inches

**Control section:** Clay content—40 to 55 percent when mixed; rock fragments—5 to 35 percent pebbles when mixed

**Other features:** Variegated very gravelly loamy sand 2C

horizon at a depth of 40 inches or more; 50 to 65 percent pebbles in the 2Cq horizon (where present)

#### A horizon:

Value—5 or 6 dry

Chroma—2 or 3

Structure—weak to moderate, very thin to very thick platy or very fine to very coarse subangular blocky

Reaction—mildly alkaline or moderately alkaline

#### Bt1 horizon:

Value—5 or 6 dry

Chroma—2 or 3

Structure—weak or moderate, very fine to medium blocky or prismatic

Consistence—very friable or friable, moist, sticky or very sticky and plastic or very plastic, wet

Reaction—mildly alkaline or moderately alkaline

#### Bt2 horizon:

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 to 4 dry, 3 or 4 moist

Clay content—40 to 55 percent, as much as 60 percent in some pedons when mixed

Rock fragments—5 to 35 percent pebbles when mixed

Structure—weak or moderate, fine to coarse prismatic or very fine to medium angular blocky

Reaction—moderately alkaline or strongly alkaline

Other features—some pedons are slightly effervescent to strongly effervescent, and commonly have lime filaments in the lower part of the Bt horizon

#### Bqk and Cqk horizons:

Hue—10YR or 2.5Y

Value—6 to 8 dry, 4 to 6 moist

Chroma—1 to 4

Effervescence—noneffervescent to violently effervescent

Cementation—thin discontinuous weakly cemented Bqk subhorizon above the continuously cemented horizon in some pedons

Relict mottles—below a depth of 30 inches in many pedons

### Winada Series

The Winada series consists of moderately deep, well drained soils that formed in residuum and colluvium derived from mixed rock sources. Winada soils are on side slopes of mountains. Slopes are 50 to 75 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 40 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Argic  
Cryoborolls

**Typical pedon:** Winada gravelly loam, 50 to 75 percent slopes, in an area of the Hapgood-Tusel-Winada association. Pebbles cover 30 percent of the soil surface:

- A1—0 to 5 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine and fine interstitial pores; 30 percent pebbles; neutral (pH 7.2); abrupt smooth boundary. (3 to 7 inches thick)
- A2—5 to 12 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine, fine, and medium roots; many very fine and fine interstitial pores; 25 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (5 to 9 inches thick)
- Bt—12 to 24 inches; brown (10YR 5/3) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; strong medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; common moderately thick clay films on peds and in pores; 30 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (9 to 16 inches thick)
- Cr—24 to 36 inches; weathered sandstone.
- R—36 inches; unweathered sandstone.

**Type location:** Lander County, Nevada; approximately 30 miles south of Battle Mountain, about 1,500 feet south and 3,000 feet west of the northeast corner of sec. 14, T. 28 N., R. 45 E.

#### Range in Characteristics

*Soil moisture:* Moist from late autumn through early summer, dry from late July through early October

*Soil temperature:* 39 to 44 degrees F

*Mean summer soil temperature:* 54 to 59 degrees F

*Mollic epipedon thickness:* 8 to 12 inches

*Combined thickness of A and Bt horizons and depth to paralithic contact:* 20 to 30 inches

*Depth to lithic contact:* 30 to 40 inches

*Reaction throughout the profile:* Neutral or mildly alkaline

**A horizon:**

Chroma—2 or 3

Consistence—soft or slightly hard dry

**Bt horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Percent clay—28 to 35 percent

Rock fragments—35 to 50 percent, mainly pebbles

Structure—moderate or strong

#### Winada Variant

The Winada Variant consists of deep, well drained soils that formed in residuum and colluvium derived from chert. Winada Variant soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 38 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Argic  
Cryoborolls

**Typical pedon:** Winada Variant very gravelly fine sandy loam, 30 to 50 percent slopes, in an area of the Sumine-Winada Variant-Pernty association:

- A1—0 to 3 inches; dark grayish brown (10YR 4/2) very gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; strong very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; 35 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (2 to 4 inches thick)
- A2—3 to 7 inches; dark grayish brown (10YR 4/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; strong fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium and coarse roots; many very fine tubular pores; 35 percent pebbles; neutral (pH 7.0); clear wavy boundary. (3 to 5 inches thick)
- Bt1—7 to 13 inches; brown (10YR 5/3) very gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine to coarse roots; many very fine tubular pores; 45 percent pebbles; few thin clay films coating rock fragments and bridging sand grains; neutral (pH 7.0); clear wavy boundary. (5 to 8 inches thick)
- Bt2—13 to 24 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine and few medium and coarse roots; common very fine tubular and few fine interstitial pores; 45 percent pebbles, 5 percent cobbles; few thin clay films coating rock fragments and bridging sand grains; neutral (pH 7.0); gradual wavy boundary. (10 to 20 inches thick)

C—24 to 45 inches; yellowish brown (10YR 5/4) extremely gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 60 percent pebbles; 15 percent cobbles; neutral (pH 7.0); clear wavy boundary. (15 to 30 inches thick)

R—45 inches; fractured chert

**Type location:** Lander County Nevada; approximately 14 miles south of Battle Mountain, about 520 feet north and 520 feet west of the southeast corner of sec. 10, T. 29 N., R. 45 E.

#### Range in Characteristics

*Soil moisture:* Usually moist in late fall through early summer, dry from late July through September

*Annual soil temperature:* 42 to 46 degrees F

*Summer soil temperature:* 55 to 59 degrees F

*Mollic epipedon thickness:* 12 to 15 inches

*Depth to bedrock:* 40 to 60 inches

*Control section:* Clay content—20 to 30 percent; rock fragments—35 to 55 percent, mainly pebbles

*Reaction throughout the profile:* Neutral or mildly alkaline

### Wiskan Series

The Wiskan series consist of moderately deep, well drained soils that formed in a thin loess layer over residuum and colluvium derived from chert, argillite, and other mixed rocks. Wiskan soils are on side slopes of crests and mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Xerollic Haplargids

**Typical pedon:** Wiskan very gravelly silt loam, 30 to 50 percent slopes, in an area of the Wiskan-Linrose association:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly silt loam, brown (10YR 4/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 35 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 4 inches thick)

A2—2 to 8 inches; light brownish gray (10YR 6/2) very gravelly silt loam, brown (10YR 4/3) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine

tubular pores; 40 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 8 inches thick)

2BA—8 to 16 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 30 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 8 inches thick)

2Btk1—16 to 25 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; few thin clay films on peds and lining pores; 45 percent pebbles, 5 percent cobbles; thin lime coatings on undersides of rock fragments; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 12 inches thick)

2Btk2—25 to 28 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; firm, hard, sticky and plastic; common very fine roots; common very fine tubular pores; common thin clay films on peds and lining pores; 45 percent pebbles, 10 percent cobbles; thin lime coatings on underside rock fragments; few lime filaments or threads; slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (3 to 8 inches thick)

R—28 inches; unweathered fractured chert.

**Type location:** Lander County, Nevada; about 6 miles southwest of Battle Mountain, about 750 feet south and 250 feet west of the approximate northeast corner of sec. 36, T. 32 N., R. 43 E.

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 44 to 47 degrees F

*Depth to bedrock:* 20 to 40 inches

*Reaction throughout the profile:* Mildly alkaline or moderately alkaline

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3 dry or moist

Structure—platy or granular

Other features—horizons having mollic colors lack the required thickness for a mollic epipedon

#### 2Btk horizon:

Hue—7.5YR or 10YR

Value—5 or 6 dry, 3 to 5 moist

Chroma—3 to 6

Texture—very gravelly clay loam, very gravelly loam, and extremely gravelly clay loam  
 Clay content—25 to 35 percent  
 Rock fragments—45 to 65 percent, mainly pebbles  
 Structure—subangular blocky or prismatic  
 Secondary lime—none to few fine filaments or threads, thin coatings on some to all rock fragments  
 Effervescence—noneffervescent to slightly effervescent matrix

### ***Xine Series***

The Xine series consists of moderately deep, well drained soils formed in residuum derived from limestone and calcareous shale. Xine soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic Calcixerolls

**Typical pedon:** Xine gravelly loam, 30 to 50 percent slopes, in an area of the Attella-Xine-Kram association. Pebbles cover 15 percent of the soil surface:

- A1—0 to 5 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine and fine interstitial pores; 15 percent pebbles; slightly effervescent; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 8 inches thick)
- A2—5 to 10 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine tubular pores; 25 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (5 to 8 inches thick)
- Bk1—10 to 18 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 3/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many fine, medium, and coarse roots; many very fine, fine, and medium tubular pores; 20 percent pebbles, 20 percent cobbles, 5 percent stones; few fine lime filaments and coatings on rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 10 inches thick)
- Bk2—18 to 33 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine

and medium roots; common very fine and fine tubular pores; 20 percent pebbles, 15 percent cobbles, 5 percent stones; common fine lime filaments and soft masses and lime coatings on rock fragments; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (5 to 21 inches thick)

Cr—33 inches; weathered, fractured calcareous shale.

**Type location:** Lander County, Nevada; about 40 miles southwest of Battle Mountain, in an unsurveyed area approximately 1,600 feet north and 5,800 feet east of the southeast corner of sec. 24, T. 25 N., R. 39 E.

### **Range in Characteristics**

**Soil moisture:** Moist in late fall through early summer, dry from July through October

**Soil temperature:** 44 to 46 degrees F

**Mollic epipedon thickness:** 7 to 14 inches

**Depth to paralithic contacts:** 20 to 40 inches

**Depth to calcic horizon:** 10 to 25 inches

**Control section:** Texture—very cobbly loam or very cobbly sandy loam; clay content—10 to 18 percent; rock fragments—35 to 60 percent, mainly cobbles; carbonates—25 to 40 percent calcium carbonate equivalent

**Other features:** Amount of secondary lime increasing with depth

**A horizon:**

Value—4 or 5 dry, 2 or 3 moist; thin A horizon that has dry value of 6 in some pedons

Chroma—2 or 3

Reaction—mildly alkaline or moderately alkaline

**Bk horizon:**

Value—5 to 7 dry, 3 to 5 moist

Chroma—3 or 4

Reaction—moderately alkaline or strongly alkaline

### ***Yipor Series***

The Yipor series consists of very deep, well drained soils that formed in some loess but mainly in mixed silty alluvium. Yipor soils are on inset fans and fan skirts. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-silty, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Yipor silt loam, moderately saline-sodic:

- A1—0 to 4 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate fine and medium

platy; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine vesicular and common very fine interstitial and tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear irregular boundary. (2 to 5 inches thick)

A2—4 to 8 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, slightly sticky and plastic; common very fine and few fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (0 to 5 inches thick)

C1—8 to 18 inches; very pale brown (10YR 7/3) very fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; violently effervescent; strongly alkaline (pH 9.0); gradual smooth boundary. (5 to 12 inches thick)

C2—18 to 38 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and very few fine roots; common very fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (4 to 20 inches thick)

Cy—38 to 60 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; very few very fine and fine roots; common very fine tubular pores; common fine rounded gypsum crystals; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Lander County, Nevada; approximately 8.5 miles southeast of Battle Mountain, about 2,600 feet west and 0.4 mile south of the northeast corner of sec. 17, T. 31 N., R. 46 E.

#### Range in Characteristics

**Soil moisture:** Usually dry, moist for short periods in winter and early spring

**Soil temperature:** 47 to 52 degrees F

**Control section:** Texture—silt loam or very fine sandy loam that has thin strata of loam in some pedons; clay content—8 to 18 percent

**Reaction throughout the profile:** Strongly alkaline or very strongly alkaline

**Effervescence:** Strongly effervescent or violently effervescent throughout the profile

**Salt and sodium:** Generally moderately or strongly saline-sodic, free of salt and sodium or slightly saline-alkali in the surface layer of some pedons

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

#### C horizon:

Value—6 or 7 dry, 4, 5, or 6 moist

Chroma—3 or 4

Other features—strata of loamy sand below a depth of 40 inches in some pedons, 5 to 15 percent lime concretions in the control section of some pedons, no gypsum crystals in the lower part of some pedons

### Zineb Series

The Zineb series consist of very deep, well drained soils that formed in loamy alluvium of some volcanic ash but mainly of mixed rock sources. Zineb soils are on inset fans, fan aprons, and fan skirts. Slopes are 0 to 15 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Zineb gravelly loam, 2 to 8 percent slopes. Pebbles cover 20 percent of the soil surface:

A1—0 to 3 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine vesicular pores; 10 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 4 inches thick)

A2—3 to 5 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; weak medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine and few fine tubular pores; 10 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); abrupt smooth boundary. (2 to 5 inches thick)

Bw—5 to 11 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine tubular pores; 15 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary. (6 to 9 inches thick)

Bq—11 to 16 inches; light yellowish brown (10YR 6/4)

very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few medium roots; common very fine tubular pores; 30 percent weak discontinuous silica cementation; 5 percent 5- to 10-millimeter, strongly cemented durinodes; 30 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 8 inches thick)

**Bqk1**—16 to 20 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; 20 percent weak discontinuous silica cementation; 35 percent pebbles, 5 percent cobbles; common medium lime coatings on undersides of rock fragments; noneffervescent matrix; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 12 inches thick)

**2Bqk2**—20 to 45 inches; pale brown (10YR 6/3) extremely cobbly loamy coarse sand, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common medium roots; common very fine tubular pores; 70 percent weak discontinuous silica cementation; 40 percent pebbles, 25 percent cobbles; many medium lime coatings on undersides of rock fragments; slightly effervescent matrix; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 30 inches thick)

**3Btbk**—45 to 60 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and plastic; common fine and medium roots; common very fine tubular pores; few thin clay films on faces of peds; 10 percent pebbles; common fine lime filaments and seams; slightly effervescent matrix; strongly alkaline (pH 9.0).

**Type location:** Lander County, Nevada; about 33 miles southeast of Battle Mountain, approximately 600 feet west and 2,440 feet north of the approximate southeast corner of sec. 33, T. 27 N., R. 47 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from June through October

**Soil temperature:** 47 to 52 degrees F

**Control section:** Rock fragments—averages 50 to 75 percent, pebbles are dominant in upper part and cobbles in lower part

**Depth to carbonates and Bk horizon:** 16 to 26 inches

**Depth to Bq horizon:** 10 to 18 inches

**Other features:** Unconformable loam subhorizon below a depth of 40 inches in some pedons

#### A horizon:

Value—5 or 6 dry, the uppermost 7 inches greater than 5.5 dry when mixed

Chroma—2 or 3

#### Bw horizon:

Value—3 or 4 moist

Chroma—3 or 4

Structure—subangular blocky; massive in some pedons

Rock fragments—15 to 35 percent, dominantly pebbles

Texture—gravelly loam or gravelly very fine sandy loam

#### Bq horizon:

Texture—very gravelly loam or very gravelly sandy loam

Rock fragments—35 to 60 percent, dominantly pebbles

Silica cementation—weak discontinuous silica cementation, durinodes, or both in a friable matrix

#### 2Bqk horizon:

Texture—extremely cobbly sandy loam to extremely cobbly loamy coarse sand or extremely cobbly coarse sand

Rock fragments—60 to 80 percent, dominantly cobbles

### Zoesta Series

The Zoesta series consists of very deep, well drained soils that formed in alluvium and colluvium derived from mixed rock sources. Zoesta soils are on summits and side slopes of mountain valley fans and fan piedmont remnants, partial ballenas, and mountain side slopes. Slopes are 2 to 50 percent. Mean annual precipitation is about 11 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Xerollic Paleargids

**Typical pedon:** Zoesta cobbly loam, 15 to 30 percent slopes, in an area of the Zoesta-Robson-Softscrabble association. Pebbles cover 20 percent of the soil surface:

**A1**—0 to 2 inches; brown (10YR 5/3) cobbly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine, fine, and medium roots; many very fine and fine vesicular pores; 15 percent pebbles, 15 percent cobbles; neutral (pH 7.2); abrupt smooth boundary. (2 to 5 inches thick)

A2—2 to 7 inches; brown (10YR 5/3) cobbly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; common very fine and fine tubular pores; 10 percent pebbles, 15 percent cobbles, 5 percent stones; mildly alkaline (pH 7.4); abrupt smooth boundary. (0 to 5 inches thick)

Bt1—7 to 12 inches; pale brown (10YR 6/3) cobbly clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and medium roots; common very fine and fine tubular pores; few thin clay films coating sand grains; 10 percent pebbles, 15 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (0 to 6 inches thick)

Bt2—12 to 18 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; strong fine and medium prismatic structure; very hard, very firm, very sticky and very plastic; few very fine roots; few fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (5 to 11 inches thick)

Bt3—18 to 23 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; strong fine prismatic structure parting to strong fine angular blocky; very hard, very firm, very sticky and very plastic; few very fine roots; few fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (5 to 9 inches thick)

Btk—23 to 31 inches; light yellowish brown (10YR 6/4) gravelly clay loam, yellowish brown (10YR 5/6) moist; strong fine prismatic structure parting to strong fine subangular blocky; very hard, very firm, sticky and plastic; common moderately thick clay films on faces of peds and lining pores; 30 percent pebbles; common fine soft lime masses; slightly effervescent matrix; moderately alkaline (pH 8.2); gradual wavy boundary. (8 to 21 inches thick)

Bqk—31 to 60 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; massive; very hard, very firm, sticky and slightly plastic; 40 percent pebbles; 15 percent strongly cemented durinodes; many large soft lime masses; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Lander County, Nevada, south part; about 16 miles north of Austin, approximately 1,900 feet south and 800 feet west of the northeast corner

of sec. 1, T. 22 N., R. 44 E. (part of the BLM private contract completed in Lander County)

### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 44 to 46 degrees F

*Combined thickness of A and Bt horizons:* 30 to 40 inches

*Depth to carbonates:* 10 to 20 inches

*Control section:* Texture—clay loam or clay; clay content—35 to 50 percent; rock fragments—less than 15 percent in the upper part; 15 to 35 percent in the lower part, mainly pebbles

*Effervescence:* Increasing with depth, secondary lime in the lower solum

*A horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Reaction—neutral or mildly alkaline

*Bt horizon:*

Value—5 or 6 dry, 3 to 5 moist

Chroma—3 to 6

Structure—moderate or strong, fine, medium, or coarse prismatic structure

Reaction—mildly alkaline or moderately alkaline

*Bqk horizon:*

Value—5 or 6 dry, 4 or 5 moist

Chroma—4 or 6

Texture—clay loam or loam that is 20 to 35 percent clay

Rock fragments—35 to 60 percent, mainly pebbles

Reaction—moderately alkaline or strongly alkaline

Other features—some pedons lack durinodes

### Zoesta Variant

The Zoesta Variant consists of very deep, well drained soils formed in residuum and colluvium derived from chert, quartzite, and extrusive volcanic rock sources. Zoesta Variant soils are on sides slopes of foothills. Slopes are 15 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Xerollic Paleargids

**Typical pedon:** Zoesta Variant gravelly loam, 15 to 30 percent slopes, in an area of the Zoesta Variant-Jung-McVegas association. Pebbles cover 45 percent and cobbles 5 percent of the soil surface:

A1—0 to 3 inches; pale brown (10YR 6/3) gravelly

loam, dark brown (10YR 3/3) moist; weak medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular pores; 25 percent pebbles; neutral (pH 7.0); abrupt smooth boundary. (2 to 5 inches thick)

A2—3 to 8 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 3/4) moist; weak medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (0 to 5 inches thick)

Bt1—8 to 13 inches; light brown (7.5YR 6/4) gravelly clay loam, dark brown (7.5YR 3/4) moist; strong fine subangular blocky structure; hard, firm, sticky and very plastic; common very fine and fine roots; common very fine tubular pores; common thin clay films on faces of peds; 20 percent pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (0 to 6 inches thick)

2Bt2—13 to 20 inches; light brown (7.5YR 6/4) clay, dark brown (7.5YR 4/4) moist; strong medium prismatic structure parting to strong coarse angular blocky; very hard, very firm, very sticky and very plastic; continuous moderately thick clay films on faces of peds; 5 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (5 to 11 inches thick)

2Bt3—20 to 27 inches; light brown (7.5YR 6/4) clay, dark brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to moderate coarse subangular blocky; very hard, very firm, very sticky and very plastic; few fine roots; few very fine tubular pores; many moderately thick clay films on faces of peds; 10 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary. (5 to 9 inches thick)

2Bt4—27 to 36 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; common fine black (10YR 2/1) manganese stains; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few fine tubular pores; common thin clay films on faces of peds; 10 percent pebbles; moderately

alkaline (pH 8.2); gradual wavy boundary. (8 to 21 inches thick)

3Bqk—36 to 60 inches; very pale brown (10YR 7/3) gravelly loam, brown (10YR 5/3) moist; common large black (10YR 2/1) manganese stains; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 40 percent weak discontinuous silica cementation; 25 percent pebbles; noneffervescent matrix; common strongly effervescent fine lime seams; moderately alkaline (pH 8.2).

**Type location:** Lander County, Nevada; about 37 miles south of Battle Mountain, approximately 2,300 feet south and 100 feet east of the northwest corner of sec. 2, T. 25 N., R. 45 E.

### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring

*Soil temperature:* 47 to 52 degrees F

*Combined thickness of the A and Bt horizons:* 35 to 45 inches

*Depth to Bqk horizon:* 35 to 45 inches

*Control section:* Clay content—45 to 60 percent when mixed; rock fragments—5 to 10 percent when mixed

*A horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 to 4

*Bt horizon:*

Hue—7.5YR or 10YR

Value—5 or 6 dry, 3 to 5 moist

Chroma—3 to 6

Clay content—55 to 65 percent in the upper part and 35 to 50 percent in the lower part

*Bqk horizon:*

Value—6 to 8 dry, 5 or 6 moist

Chroma—3 to 6

Texture—loam or sandy loam

Rock fragments—15 to 35 percent, mainly pebbles

Cementation—20 to 50 percent discontinuous weak silica cementation; thin strata of continuous weak cementation in some pedons

Reaction—moderately alkaline or strongly alkaline

Other features—some pedons lack durinodes



# Formation of the Soils

---

Soil is a natural body on the earth's surface in which plants grow. It is a mixture of varying proportions of rocks, minerals, organic matter, water, and air. The rocks and minerals are fragmented and are partly or wholly weathered. Soils have distinctive layers, or horizons, that are parallel to the soil surface. Soil horizons are the product of environmental forces acting upon material deposited or accumulated through geologic activity.

Soils differ from one another in different localities and within short distances. The differences are the result of the interaction of five soil-forming factors that affect soil formation. These factors are biological forces, mainly the plant cover and the organisms living in and on the soil; climate, mainly the temperature and kind and amount of precipitation that have existed since accumulation of the parent material; relief, mainly as it affects the internal and external soil properties, such as drainage, aeration, susceptibility to erosion, and exposure to sun and wind; and parent material, including texture and structure of the material as well as its mineralogic and chemical composition; and the length of time that the soil-forming factors have been operating. The combination of these factors forms a view of soil genesis as a holistic ecosystem (13).

The soil formation factors combine and interrelate to create soil properties which define soil horizons. The age or strength of expression of the soil horizons is a reflection of the amount of weathering of parent material resulting from the interaction of moisture, temperature, and biological activity as influenced by time. The kinds and combinations of diagnostic horizons and other diagnostic properties (26, 27), together with their strength of expression, provide clues to the age of the soils in the area. Important diagnostic horizons present in soils within the area include the mollic epipedon, the cambic, argillic, and natric horizons, and the silica-cemented horizons.

The mollic epipedon is a thick, dark colored surface horizon that has a high base saturation and that formed in areas where organic matter can accumulate faster than it is oxidized. When conditions are favorable, the mollic epipedon can form in 100 to 1,000 years (27). It

formed mainly through the additions of organic matter to the soil in the form of decomposed roots and organic residues from the surface. On recent soils, it sometimes occurs as the only diagnostic horizon, and on older soils, it sometimes occurs in combination with other diagnostic horizons.

The characteristics of cambic horizons have been identified in this survey area. They are the redistribution of soluble salts and carbonates to a lower position in the soil profile, the oxidation of subsoil, and the alteration of the original parent material stratification to platy or blocky soil structure. Cambic horizons occur in soils formed on stable Holocene land surfaces. For example, in southern New Mexico cambic horizons are less than about 5,000 years old (8, 11). In this survey area and in northern and central Nevada, cambic horizons generally formed between 5,000 and 10,000 years before present. Their age has been determined mostly as a result of soil mapping in areas near and below the last high stage of Lake Lahontan-age Pleistocene lakes (12, 14, 16, 18). Cambic horizons also occur in soils that have thin layers of Mazama ash in their profiles.

Argillic horizons are subsurface horizons of alluvial clay accumulation. Prominent argillic horizons in this area generally occur in soils that formed on Wisconsinan-age and pre-Wisconsinan-age surfaces. This concept was the conclusion of studies in the Southwest (9, 10) and in Nevada (5, 12, 15, 19) and is further supported in Soil Taxonomy (27). With increasing age and constancy of other conditions, argillic horizons become finer in texture and somewhat thicker and tend to develop abrupt upper boundaries.

Natric horizons are special kinds of argillic horizons whose physical and chemical properties have been influenced as the result of a high exchangeable sodium content. Following earlier development as argillic horizons, prominent natric horizons may have developed their present characteristics as the result of eolian deposits supplying sodium. Transportation and deposition of sodium salts with eolian deposits are believed to be important present-day processes that affect soils in the area.

Volcanic glass, found in deposits derived from pyroclastic material and in eolian deposits of volcanic ash, is a source of silica for the formation of durinodes and duripans in many of the soils in the survey area. Holocene soils developed in deposits containing a volcanic ash-rich zone generally have weakly to moderately cemented horizons rich in silicious material amorphous to x-rays (12). These zones are described in soils as horizons with durinodes, discontinuous silica cementation, or continuous silica cementation, each grading from incipient to strong. Forms of silica cementation strongly influenced by volcanic ash apparently are capable of forming during a relatively short period of time and are probably less than 7,000 years old. Platy or laminated forms of duripans with or without thin, discontinuous laminar forms of duripans tend to develop in loamy material. Duripans are massive, platy horizons that are cemented with silica and, in some instances, with accessory calcium carbonates. Because of their association with prominent argillic horizons, massive duripans capped with silica-cemented laminar layers are probably the oldest kind of duripan in the area and are of early Wisconsinan to pre-Wisconsinan age.

The overall landscape of the area, mainly the mountains and valleys, is the result of geologic stratigraphic and structural control. The present topography and landforms, however, are primarily the result of events during Quaternary time. The kinds of soils that formed are indicative of the stability and age of the surfaces of landforms on which they occur. The degree of development of diagnostic subsurface horizons in the soils of this area indicates a soil sequence that ranges in age from present day, Holocene, to pre-Wisconsinan. This range in age is a major reason for the many kinds of soils in the area.

## Climate

The major climatic forces that influence soil formation are precipitation and temperature. Recent soils reflect the present climate, which can be directly related to soil development. Soils older than Holocene were created under past climatic conditions. Morrison and Frye propose that accelerated soil formation occurred during unique climatic periods, while the climate prevailing between these periods was not conducive to soil formation (16, 17, 18, 19).

The present desert climate began at the start of the Pleistocene (4), but both precipitation and temperature have fluctuated widely. At present, the characteristics of the climate are warm, dry summers and cool, moist winters. North-south trending mountain ranges strongly

influence precipitation. Precipitation from the storms in the survey area increases with increasing elevation. Consequently, the average annual precipitation ranges from about 6 inches in the lowest elevations of Buffalo and Crescent Valleys to about 16 inches or more at the highest elevations in the Shoshone Range. The precipitation falls mainly in winter and spring.

The average annual air temperature ranges from about 50 degrees F at the lower elevations of the western valleys to about 41 degrees F or lower in some of the high mountain ranges. In winter, freezing and thawing generally occur throughout the survey area, except in those areas that generally are insulated by snow cover. The effects of frost action are heaving plants, developing miniature rings, rock stripes, and eroded surface soils resulting from solifluction. At some of the higher elevations, freezing and thawing have fractured and displaced the bedrock.

Major climatic variations are the result of the effects of topography and relief. Temperature decreases with elevation, while precipitation increases with elevation. The soils in the survey area reflect a general zonation with respect to elevation and longitudinal location. As precipitation increases, leaching increases and the production of native vegetation increases, both resulting in an increased organic matter supply and a recycling of the bases. Combinations of and fluctuations in temperature and moisture affect the rate of organic matter accumulation and decomposition and of mineral weathering (6, 13).

At the lower elevations of 4,400 to 5,000 feet within the survey area, the average annual precipitation is about 6 to 8 inches and the average annual air temperature is about 48 to 50 degrees F. In this warm, arid part of the survey area, there is no surplus soil moisture to percolate through the soil. Chemical weathering of parent material is slow, leaching is incomplete, and eluviation and illuviation proceed at a very slow rate. The plant cover is sparse and consists mainly of drought- and salt-tolerant shrubs. Typically, the soils are low in organic matter content and have a thin, light-colored A horizon. Soluble salts, calcium carbonate, and silica accumulate in the soil profile at a relatively shallow depth. Duric Camborthids (Broyles series) and Duric Natrargids (Beoska series) reflect soil formation in this climatic zone.

At elevations of 5,000 to 6,500 feet within the survey area, the average annual precipitation is about 10 inches and the average annual air temperature is about 47 degrees F. In this warm, semiarid part of the survey area, the plant cover is thicker than at the lowest elevations. Also, it consists mainly of drought-tolerant shrubs and grasses. Chemical weathering of parent

material proceeds at a slow rate. Typically, weathering products are leached to the lowest profile below the root zone and calcium carbonate and silica accumulate in the lowest part of the soil profile. Soluble salts are completely leached or concentrated deep within the profile. Typically, the soils are moderately low in organic matter content and have a thin, relatively dark colored or thicker, light-colored A horizon and thicker cambic or argillic horizons over horizons of silica or carbonate accumulation. Durixerollic Camborthids (Orovada series) in the valleys and Lithic Xerollic Haplargids (Punchbowl series) in the foothills reflect soil formation in this climatic zone.

At elevations of 6,500 to 8,000 feet, the average annual precipitation is about 12 to 14 inches and the average annual air temperature is about 43 to 46 degrees F. In this cool, semiarid part of the survey area, the increased precipitation and decreased evapotranspiration result in a dense plant cover consisting mainly of shrubs and perennial grasses and localized stands of singleleaf pinyon and Utah juniper. The lower temperatures cause a slower rate of organic matter decomposition resulting in the build up of organic matter in the surface layer. Chemical weathering is moderate in this climatic zone, leaching is complete, and eluviation and illuviation commonly proceed at a moderate rate. Typically, the soils have a thick, dark mollic epipedon and a moderately leached subsoil. Aridic Haploxerolls (Loncan series) and Aridic Argixerolls (Sumine series) reflect soil formation in this climatic zone.

At the highest elevations, up to 9,600 feet, the average annual precipitation is about 14 to more than 16 inches and the average annual air temperature is about 41 to 43 degrees F. This cold part of the survey area consists mainly of windswept mountain crests and side slopes, sheltered snow pockets, and mountain back slopes, which accumulate drifted snow. The rate of weathering is maximal for the survey area. Excessive leaching has removed most soluble products, resulting in a generally lower base saturation than in other climatic zones. The slow rate of organic matter decomposition results in a thick, dark A horizon. The vegetation in areas that accumulate drifted snow is thick, mountain shrub-grass. Windswept areas have reduced effective precipitation, which is reflected in the lower production of plants. Soils on stable, north-facing snow pockets may be older than their profile development may predict. These soils remain cold most of the year, thus inhibiting soil development. During glacial periods these soils may have remained frozen or under snow cover throughout the year. Pachic Cryoborolls (Hapgood series) and Argic Cryoborolls (Packer series) reflect the soil formation in this climatic

zone. These soils are on mountain back slopes and on windswept mountain crests, respectively.

## Relief

Relief pertains to the shape of the landscape and includes the position of water tables. These shapes are combinations of slope inclination, length of slope, concavity or convexity, and exposure to wind and sun. Any happening on a slope, including erosion and deposition, affects soil formation (13).

In the landscapes of Lander County, North Part, subparallel mountain ranges rising abruptly from broad, alluvium-filled valleys are dominant. The valleys are essentially either bolsons or semibolsos that receive drainage water mainly from the surrounding mountain ranges. Fan piedmonts and fan skirts slope down from the mountains and decrease in slope until they merge with alluvial flats and finally into central playas or axial stream flood plains (22).

The nearly level, axial stream flood plains along the Humboldt and Reese Rivers are poorly drained or very poorly drained. Runoff is very slow, most of the soils are subject to flooding, and some areas receive deposition. The soils in these areas support dense stands of meadow vegetation. These stands have contributed a large amount of organic matter to the soils, producing a thin to thick, dark colored A horizon. Some of these soils have excess soluble salts in their upper horizons. Examples of these soils are Fluvaquentic Haplaquolls (Humboldt and Parana series) and Aeris Fluvaquents (Sonoma series).

Alluvial flats and lake plains are somewhat poorly drained. Runoff is slow, and the erosion hazard is low. These soils have developed horizons with various stages of silica cementation. These soils are light colored and contain soluble salts. Aeris Halaquents (Umbertland and Reese series) represent soils in these areas.

Remnants of flood plains, alluvial flats, and lake plains underwent similar processes of soil formation. Apparently during the early Holocene Epoch, these areas were poorly drained and subject to seasonal flooding as evidenced by the relict mottling and the low landscape position. The fluctuating water table combined with the volcanic ash-rich parent material and with the alkaline reaction produced horizons of firm durinodes or concentrations of silica cementation. As the climate became drier during mid-Holocene time, streams slowly downcut the flood plain areas, lakes receded in the bolson areas, and subtle dissection took place (3, 19). This left stable remnants of flood plains, alluvial flats, and lake plains that had lower water tables and little or no flooding. Today, these soils are

moderately well drained or well drained, runoff is slow, and the hazard of erosion is low. They contain soluble salts throughout the soil profile. Durorthidic Torriorthents (Bubus series) on remnants of alluvial flats and lake plains and Aquic Duric Haploxerolls (Rixie series) on flood plain remnants represent soils in these areas.

Fan skirts are extensive in this area. They border the fan piedmonts and extend downslope and merge with alluvial flats. They are well drained, runoff is slow or medium, and the hazard of erosion is slight or moderate. These surfaces are relatively smooth and undissected. Durixerollic Camborthids (Rasille series), Typic Camborthids (Whirlo series), and Duric Camborthids (Broyles series) are examples of soils on fan skirts.

Fan piedmonts flank the mountain ranges. They are well drained, runoff is slow or medium, and the hazard of erosion is slight or moderate. Fan piedmonts are typically dissected because of an altered stream regimen resulting from past climatic changes or locally from block faulting. The dissection pattern has resulted in the formation of smooth, fan-piedmont-remnant summit areas, younger fan-piedmont-remnant side slopes, and very young inset fans along drainageways. Duric Natrargids (Oxcorel series) and Haploxerollic Durargids (Cherry Spring series) on fan-piedmont-remnant summits, Durixerollic Haplargids (Pineval series) on fan-piedmont-remnant side slopes, and Typic Torriorthents (Soolake series) on inset fans are examples of soils in these areas.

Most of the foothills and mountains show pronounced aspect-related microclimatic differences. Steep, north-facing slopes at lower elevations may exhibit soil profiles similar to all aspects in a higher elevation zone, but high elevation, steep, south-facing slopes may exhibit soil profiles similar to a lower elevation zone (6, 13).

In the mountain ranges, the main characteristics are excessive relief. They are well drained, runoff is medium to very rapid, and the hazard of erosion is moderate or high. On partially stabilized mountain surfaces subject to a high rate of geologic erosion, soil development is mainly limited to the differentiation of primary horizons and the accumulation of organic matter. Lithic Xeric Torriorthents (Attella and Hopeka series) are examples of soils on less stable mountain slopes. Cambic or argillic horizons have formed in soils on more stable mountain surfaces where the rate of geologic erosion has been slower. Durixerollic Camborthids (Humdun series) are examples of soils that have a cambic horizon and Xerollic Haplargids (Trunk series) are examples of soils that have an argillic horizon that formed on more stable mountain slopes.

## Biological Forces

Plants, animals, insects, and microflora are important biological forces that affect soil formation in the survey area. Although mammals, such as badgers and ground squirrels, and insects, such as cicadas and ants, have had some affect on soil development, plants appear to have had the most influence on the soils in this survey area.

The vegetation in the area has been particularly important in stabilizing the land surfaces so that soil formation could take place. It protects the surface from erosion and thus increases stability. In addition, plant roots help develop soil structure and aggregate stability.

Because of climatic differences, plants vary considerably in species and amounts as elevation increases. On flood plains where drainage is restricted, the dense growth of meadow vegetation has supplied the organic matter that gives the Fluvaquentic Haplaquolls (Paranat series) a dark colored A horizon.

On fan piedmonts, fan skirts, alluvial flats, and lake plains at low elevations, the main plants are drought- and salt-tolerant shrubs (22). Available moisture is scarce, and plants cover only a small part of the surface. They add little organic matter to the soils and provide little protection from the wind and sun. Salt-tolerant shrubs also tend to recycle salts from the deeper layers to the surface soil. An example of soils formed in these vegetation types are Duric Natrargids (Beoska series) on fan piedmonts and Aeric Halaquepts (Ocala series) on alluvial flats.

Fan piedmonts, fan skirts, and foothills at higher elevations support a plant cover of shrubs and grass that is transitional from desert shrubs. The density of plants is somewhat greater, soluble salts are deeper in the soil profile, and the A horizon of these soils has accumulated moderate amounts of organic matter. An example of soils formed in this vegetation type are Durixerollic Haplargids (Pineval series) on fan piedmonts and Xerollic Haplargids (Trunk series) on foothills.

The mountainous areas support denser stands of shrubs, grasses, and, in some places, trees. Because of the more abundant vegetation, the A horizon of the soils in these areas is thick, high in organic matter, and dark in color. An example of soils formed in this vegetation type are Aridic Argixerolls (Slaven series).

## Parent Material

Parent material is the weathered rock or unconsolidated material from which soils form. The hardness, grain size, and porosity of the parent material and its mineralogic and chemical composition greatly

influence soil formation. The main sources of parent material in the survey area are sedimentary rock and associated metamorphic rock, intrusive and extrusive volcanic rock, colluvium, alluvium, lacustrine sediments, and eolian material.

The sedimentary rock in the area includes shale, chert, conglomerate, breccia, and localized areas of limestone and dolostone. It has supplied the parent material for soils in the central Shoshone and Toiyabe Ranges and the Augusta and Battle Mountains. Most of the materials contain minerals that weather to clay. Soils formed in this residuum on stable landscapes have a developed argillic horizon; for example, Lithic Argixerolls (Graley series) and Aridic Argixerolls (Slaven series). In some areas, soils have not been stable long enough for the formation of an argillic horizon; for example, Aridic Haploxerolls (Linrose series) and Lithic Xeric Torriorthents (Attella series).

The volcanic rock in the area includes andesite, rhyolite, ash flow tuffs, basalt, and small localized areas of granite. Volcanic rock is the parent material for the soils in the Fish Creek Mountains, Sheep Creek Range, and the northern and southern tips of the Shoshone Range. Volcanic rock contains appreciable quantities of minerals that weather to clay. Therefore, most soils formed in volcanic residuum on stable landforms have a developed argillic horizon. Examples of these soils are Aridic Argixerolls (Alyan series), Lithic Argixerolls (Chen series), Xerollic Durargids (Reina series), and Xerollic Haplargids (Bucan series).

The sedimentary and volcanic rocks are the major sources of colluvium, alluvium, and basin fill material in adjacent valleys. The pyroclastic material from these rocks strongly influences soils in the valleys throughout the survey area. The more siliceous rocks, particularly chert, tuff, and volcanic ash, are the major sources of silica for the cementation of soil horizons.

Some late Tertiary basin fill material has partially lithified and consolidated. It occurs primarily in the Fish Creek Basin and along two ancient alluvial divides, between Middle Reese Valley and Carico Lake Valley and between Grass Valley and the south end of Crescent Valley. This material consists of older lakebed deposits containing interbedded tuffaceous sediments, diatomaceous shale, siltstone, sandstone, and conglomerate. The deposits have been severely dissected to resemble low, rolling hills. The summits have been stable for short periods of time, and the side slopes are actively eroding and are too unstable to form diagnostic horizons. Xerollic Haplargids (Genaw series) are an example of soils on stable summits. Xeric Torriorthents (Puett series) and Typic Torriorthents (Perlor series), for example, are shallow, undeveloped soils on active side slopes.

Colluvium has accumulated on mountain slopes as a result of gravitational forces and mass wasting. It generally is poorly sorted, contains many rock fragments, and includes minerals that weather to clay. Many of the colluvial landscapes have not been stable long enough for the formation of an argillic horizon. Xerollic Camborthids (Minat series), for example, are soils in colluvial positions.

Alluvium deposited from mixed rock sources on fan piedmonts is mostly loamy textured and contains pebbles, cobbles, and stones. It is porous and contains minerals that weather to clay and soluble silica. Haplic Nadurargids (Golconda series) and Xerollic Durargids (Buffaran series) are examples of soils that have an argillic horizon over a duripan that formed on stable fan piedmonts.

Some alluvium is deposited below the fan piedmonts as fan skirts. It consists of loamy and silty material mixed with additions of loess that contains high amounts of volcanic ash. Some localized areas of alluvium along drainageways contain pebbles, cobbles, and stones. Soils on fan skirts typically have horizons of silica accumulation. Some examples of alluvial soils are Durorthidic Torriorthents (Misad series) and Duric Camborthids (Relley series).

Some alluvium is deposited below the fan skirts as alluvial flats or flood plains. It consists of silty and clayey material, and in some areas it contains soluble salts. Although this alluvial material contains weatherable minerals, alluvial soils are young and exhibit limited soil development. Aeric Halaquepts (Ocala series) on alluvial flats and Fluvaquentic Haplaquolls (Humboldt series) on flood plains, for example, are alluvial soils.

Sandy eolian materials are of limited extent and mainly in the Buffalo, Grass, and Humboldt River Valleys and on low hills north of Battle Mountain. Sandy textured soils, such as Xeric Torripsamments (Goldrun series), have formed on stabilized dunes and on less active sand sheets associated with fan piedmonts and low hills. Typic Torripsamments (Isolde series) formed in wind-active areas on semistabilized dunes and dunes superimposed over beach plains.

Volcanic ash, presumed to be Mazama ash, and alluvium deposited following the ashfall were the sources of soluble silica in the formation of durinodes and duripans in the soils of this survey area. The Mazama ash (7) has been buried and preserved as thin strata in soils along the Reese and Humboldt Rivers. The soils that Mazama ash influenced, for example, are Duric Camborthids (Antel series) on fan skirts, Aeric Halaquepts (Wendane series) on alluvial flats, and Aquic Duric Haploxerolls (Rixie series) on flood plains.

## Time

Time is required for rock and mineral weathering and soil horizon formation. Soil scientists and field geologists, however, do not well understand the interaction of time and other soil-forming factors. Some believe the weathering of parent material and the development of soil profiles have been essentially continuous and have changed little in rate throughout Quaternary time (20, 21, 24, 29). Recently in differentiating Quaternary deposits, geologists have proposed that soil development, instead of proceeding continuously at the same rate, has taken place intermittently at a rapid rate (16, 17, 18, 23).

The present desert climate began at the start of the Pleistocene (4). However, both precipitation and temperature have fluctuated widely. During cooler and wetter pluvial periods, increasing precipitation and cooler temperatures increased runoff, causing increased erosion, mass wasting, and deposition. These climatic conditions reduced evaporation in the basins, and permanent lakes developed in the bolson floors. These pluvial lake cycles corresponded with intervals of glaciation in the Sierra and Ruby Mountains. Maximum eolian activity usually marked a change to a cool but drier climate at the beginning of the interglacial periods. This climate change led to a warm, dry period and then to a warm, wet period, during both of which soil forming was maximal (3, 5, 17, 18). These interglacial peaks of soil-forming climate occurred world wide; therefore, weathering profiles that formed in different regions during soil-forming maxima can be correlated and are "time-parallel."

These soil-forming maxima usually followed periods of intense erosion and deposition. Afterwards, the land surface stabilized when the climatic factors were favorable for a greatly accelerated rate of chemical weathering. Geologists have developed the technique of mapping soil stratigraphic units that use weathering profiles as stratigraphic markers to differentiate and correlate Quaternary deposits. This process is termed soil stratigraphy (18). Soils "time-parallel" to those formed on previously researched stratigraphic surfaces have been detailed in fieldwork in other parts of Nevada (5, 12, 15). Comparing soils in this survey area to similarly developed soils in researched areas has provided a practical technique to help establish local "time-parallel" soils. Volcanic ash falls and radiocarbon dating from nearby archaeological sites also provide valuable stratigraphic controls. Although soils apparently developed during each soil-forming maxima, subsequent depositions may have eroded away or covered representative profiles. Therefore, gaps occur in our time-soil profile sequence. For purposes of this

discussion, the time-stratigraphic names of Birkland will be used: Holocene, Wisconsinan, and pre-Wisconsinan age (6).

## Holocene Soils

Holocene-age soils range from recently eroded or deposited material to soils exhibiting characteristics similar to soils bearing the stratigraphic markers described below.

Hawley and Wilson (5) proposed that the distinct bed of Mazama volcanic ash (7) along the Humboldt River overlying late-Wisconsinan deposits represents a tentative marker for the Pleistocene-Recent boundary in the Winnemucca area. This widely spread volcanic ash bed extends into Lander County. It is preserved and interbedded with flood plain deposits along the Humboldt River (Wendane series) Meander Belt. It is also interbedded with young alluvium on fan skirts in Antelope Valley (Antel series). These soils and similar "time-parallel" soils are less than 6,600 years old. Mifflin and Wheat proposed that the age of shoreline features in Buffalo and Grass Valleys be correlated with that of the last Lake Lahontan high lake stand estimated at 11,000 years before present, or very late in the Wisconsinan Glaciation. After the lakes receded, Durorthidic Torriorthents soils (Bubus series) formed on geomorphic surfaces and Aquic Durorthidic Torriorthents (Gund series) formed below those shoreline features. Many of these soils are still aggrading. These soils, similar "time-parallel" soils, and soils exhibiting less soil development are all considered to be of Holocene age. Soils in the area are arrayed according to the strength of expression of their soil properties and horizons.

The youngest soils in the area formed in very recently aggraded material or in material that erosion recently exposed. These soils do not have a diagnostic horizon and essentially resemble the original parent material. Included among these soils are Aquic Torriorthents (Needle Peak series), which formed in recent alluvium; Typic Torripsamments (Isolde series), subject to eolian activity on semistabilized sand dunes; and Xeric Torriorthents (Puett series), which formed in soft, semiconsolidated Tertiary sediments on low, rolling hills where geologic erosion has been active.

Somewhat older than the youngest soils are the soils formed in alluvium on axial stream flood plains or slowly aggrading inset fans, or those formed on relatively recently eroded mountain slopes. These soils have been stable long enough to accumulate organic matter and form a mollic epipedon. They do not have a cambic, argillic, natric, or calcic horizon, or durinodes or duripans. They are probably less than about 1,000

years old. Some examples of these soils are Fluvaquentic Haploxerolls (Rose Creek series) on axial stream flood plains; Cumulic Haplaquolls (Welch series) on inset fans in narrow mountain valleys; and Aridic Haploxerolls (Loncan series) on mountain side slopes.

Stable Holocene land surfaces less than about 8,000 years and more than 2,000 years old are extensive in the survey area. These soils formed in parent material containing appreciable amounts of volcanic glass. With the volcanic ash as a source of soluble silica along with the alkaline reaction and fluctuating water table, durinodes and layers of incipient silica cementation probably formed relatively rapidly. Examples of soils exhibiting horizons with variable amounts of volcanic ash-influenced silica accumulation are Aquic Duric Haploxerolls (Rixie series) on axial stream flood plains; Aquic Durorthidic Torriorthents (Gund series) on lake plains; Aeris Halaquepts (Reese series) on alluvial flats; and Durorthidic Torriorthents (Bubus series) on alluvial flat remnants. Early to mid-Holocene-age soils formed on inset fans, fan skirts, beach terraces, and foothills, have a cambic horizon, and, in some areas, have silica cementation. Examples of these soils are Durixerollic Camborthids (Rasille series) on fan skirts; Xerollic Camborthids (McConnel series) on beach terraces; Typic Camborthids (Wholan series) on inset fans; and Xerollic Camborthids (Minat series) on foothills.

The landscapes in some areas are less stable and have been eroded during late Wisconsinan time, thus exposing relict duripans. Loess and loamy alluvium from surrounding land surfaces blanketed these exposed subsurface horizons to a shallow depth during middle to early Holocene time. Soil development in recent alluvium is minimal. Xerollic Durorthids (Chiara series) on fan piedmonts and Typic Durorthids (Osoll series) on foothills, for example, formed in alluvium.

### Wisconsinan-Age Soils

Deposits of Wisconsinan age are widely distributed in the survey area. Early Wisconsinan fan and stream terrace deposits were generally more extensive and coarser than the late Wisconsinan-early Holocene deposits. A widespread veneer of loess covered these coarse deposits during middle Wisconsinan time. Typically, these deposits lie on higher geomorphic surfaces than the Holocene deposits and are now dissected. Morrison proposed a weathering profile, called the Churchill Soil in the Lake Lahontan area, as a useful marker for differentiating the early Wisconsinan deposits from the late Wisconsinan deposits (17). Hawley and Wilson tentatively correlated soils in the Winnemucca area to this aged surface (15). Soils in Lander County that consist of loess-influenced alluvium

over coarse alluvium have similar soil morphological characteristics to the soil in the Winnemucca area. These soils, Duric Natrargids (Beoska series), and "time-parallel" soils exhibiting similar soil development are considered mid-Wisconsinan age.

Wisconsinan and pre-Wisconsinan-age soils represent about half of the soil series mapped in the survey area. These soils occur extensively on mountains, plateaus, foothills, and fan piedmonts. The extensive areas of these kinds of soils show that major erosional and depositional events have not taken place. Rather, such events have been minor in extent since late Pleistocene time when the climate stabilized.

Stable, late Wisconsinan or early Holocene land surfaces are likely not extensive in this area. Soils that formed on these surfaces have a thin, weak, or minimal argillic horizon. Xerollic Haplargids (Genaw series), which have a minimal argillic horizon that soft bedrock underlies at a depth of less than 20 inches, is an example of soils formed on this aged surface.

Stable, middle Wisconsinan-age land surfaces are very extensive. Soils formed on this aged surface have a dominantly fine-loamy or loamy-skeletal argillic or natric horizon. Soils that have not been subject to excessive leaching also have horizons of silica accumulation below the argillic or natric horizon. Durixerollic Haplargids (Allor series) are examples of soils that have an argillic or a duric horizon on fan piedmonts; Duric Natrargids (Ricert series) are examples of soils with natric and duric horizons on fan piedmonts; Aridic Argixerolls (Reluctan series) and Typic Argixerolls (Clan Alpine series) are examples of soils that have an argillic horizon and that are on mountain slopes.

Stable, early Wisconsinan-age land surfaces are extensive. These soils have a well developed argillic horizon. They are on older, stable land surfaces where the original subsurface horizons neither have been eroded nor deeply buried under sediment. Haplic Nadurargids (Golconda series) that have a thick natric horizon and a thin duripan are examples of soils on fan piedmonts. Xerollic Haplargids (Vanwyper series), which have a clayey-skeletal argillic horizon formed in residuum, are an example of soils on foothills. Aridic Argixerolls (Walti series) have a clayey argillic horizon formed in residuum and are an example of soils on mountain slopes.

### Pre-Wisconsinan-Age Soils

Pre-Wisconsinan alluvial deposits are of limited exposure in the soil survey area. Morrison recognized two pre-Wisconsinan depositions and weathering profiles; one correlative with the Kansan Glaciation (pre-

Cocoon soil) and a younger one, somewhat less dissected, at somewhat lower elevations correlative with the Illinois Glaciation (Cocoon soil) (17). Examples of "time-parallel" soils with these weathering profiles in this survey area are the Buffaran series and the Cherry Spring series, respectively.

Stable, pre-Wisconsinan-age surfaces are moderately extensive in this area. These surfaces are deeply dissected and are limited to fan piedmont remnants, partial ballenas, and isolated mountain side slopes. The land surfaces since dissection have been relatively stable, and the soils developed on these remnant surfaces are considered the oldest in the survey area. Xerollic Durargids (Buffaran series) and Xerollic

Nadurargids (Cortez series) are examples of soils on fan piedmont remnants. These soils generally have a thick, clayey argillic or natric horizon and a thick, indurated duripan. Xerollic Paleargids (Zoesta series), which have a thick, clayey argillic horizon that has an abrupt upper boundary, are an example of soils formed on partial ballenas. Aridic Palexerolls (Floer series) are an example of soils formed on mountain side slopes.

Soil horizon thickness and other characteristics of the local "time-parallel" soils described above are compared with soils in this survey area to estimate relative age relationships. The amount of time required for soil formation depends on the other soil-forming factors.



# References

---

- (1) American Association of State Highway and Transportation Officials. 1982. Standard specifications for highway materials and methods of sampling and testing. Ed. 13, 2 vols., illus.
- (2) American Society for Testing and Materials. 1985. Standard test method for classification of soils for engineering purposes. ASTM Stand. D 2487.
- (3) Anters, E. 1948. Climatic changes and pre-white man, in the Great Basin, with emphasis on glacial and postglacial times. *Utah Univ. Bull.*, vol. 38, No. 20, pp. 168-191.
- (4) Axelrod, D.I. 1950. Evolution of desert vegetation in western North America. *Carnegie Inst. Publ.* 590, pp. 215-306.
- (5) Birkeland, P.W. 1967. Correlation of soils of stratigraphic importance in western Nevada and California, and their relative rates of profile development. *In* *Quaternary Soils. INQA Proc.*, vol. 9, VII Congr., pp. 71-91.
- (6) Birkeland, P.W. 1974. *Pedology, weathering, and geomorphological research.* Oxford Univ. Press, Inc., 285 pp.
- (7) Davis, J.O. 1978. Quaternary tephrochronology of the Lake Lahontan Area, Nevada and California. *Nev. Archaeol. Surv.*, Univ. Nev., Reno, Res. Pap. No. 7.
- (8) Gile, L.H. 1966. Cambic and certain noncambic horizons in desert soils of southern New Mexico. *Soil Sci. Soc. Am. Proc.* 30: 773-781.
- (9) Gile, L.H., and R.B. Grossman. 1968. Morphology of the argillic horizon in desert soils of southern New Mexico. *Soil Sci.*, vol. 106, No. 1, pp. 6-15.
- (10) Gile, L.H., and J.W. Hawley. 1966. Periodic sedimentation and soil formation on an alluvial fan piedmont in southern New Mexico. *Soil Sci. Soc. Am. Proc.* 30: 261-268.
- (11) Gile, L.H., F.F. Peterson, and R.B. Grossman. 1966. Morphological and genetic sequences of carbonate accumulation in desert soils. *Soil Sci.* 101: 347-360.
- (12) Hawley, J.W., and W.E. Wilson III. 1965. Quaternary geology of the Winnemucca area, Nevada. *Desert Res. Inst., Univ. Nev., Reno, Tech. Rep.* 5, 66 pp., illus.
- (13) Jenny, Hans. 1980. The soil resource. *In* *Ecological Studies*, vol. 37, Springer-Verlag, Inc., 377 pp., illus.
- (14) Mifflin, M.C., and M.M. Wheat. 1979. Pluvial lakes and estimated pluvial climates of Nevada. *Nev. Bur. of Mines and Geol., Univ. Nev., Reno, Bull.* 94, 57 pp. illus.
- (15) Mock, R.G. Correlation of land surfaces in the Truckee River Valley between Reno and Verdi, Nevada. Unpublished M.S. thesis, Univ. Nev., Reno.
- (16) Morrison, R.B. 1964. Lake Lahontan: Geology of the Carson Desert, Nevada. *U.S. Geol. Surv. Prof. Pap.* 401, 156 pp., illus.
- (17) Morrison, R.B. 1965. Quaternary geology of the Great Basin. *In* *The Quaternary of the United States.* Princeton Univ. Press, pp. 265-285.
- (18) Morrison, R.B. 1965. Principles of Quaternary soil stratigraphy. *In* *Quaternary Soils. INQA Proc.*, vol. 9, VII Congr., pp. 1-69.

- (19) Morrison, R.B., and J.C. Frye. 1965. Correlation of the middle and late Quaternary successions of the Lake Lahontan, Lake Bonneville, Rocky Mountain (Wasatch Range), southern Great Plains, and eastern midwest areas. Nev. Bur. Mines and Geol., Univ. of Nev., Reno, Rep. 9, 45 pp., illus.
- (20) Nikiforoff, C.C. 1942. Fundamental formula of soil formation. Am. J. Sci. 240: 847-866.
- (21) Nikiforoff, C.C. 1949. Weathering and soil evolution. Soil Sci. 67: 219-223.
- (22) Peterson, Frederick F. 1981. Landforms of the Basin and Range province defined for soil survey. Nev. Agric. Exp. Stn. Tech. Bull. 28, 52 pp., illus.
- (23) Richmond, G.M. 1962. Quaternary geology of the La Sal Mountains, Utah. U.S. Geol. Surv. Prof. Pap. 324, 135 pp., illus.
- (24) Springer, M.E. Soil formation in the desert of the Lahontan Basin, Nevada. Unpublished Ph.D thesis, Univ. Calif.
- (25) Stewart, J.H., and E.H. McKee. 1977. Geology and mineral deposits of Lander County, Nevada. Nev. Bur. Mines Bull. 88, 106 pp., illus.
- (26) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. (Suppl. replacing pp. 172-188, issued May, 1962).
- (27) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.
- (28) United States Department of Agriculture. 1983. National soils handbook. Soil Conserv. Serv.
- (29) Ward, W.T. 1965. Soils of the Adelaide Area, South Australia, in relation to time. *In* Quaternary Soils. INQA Proc., vol. 9, VII Congr., pp. 293-306.

# Glossary

---

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted. The degrees of alkalinity, expressed as exchangeable sodium percentage, are:

|                      |              |
|----------------------|--------------|
| Nonalkali.....       | less than 15 |
| Slightly alkali..... | 15 to 40     |
| Strongly alkali..... | more than 40 |

**Alluvial fan.** A semiconical, or fan-shaped, constructional major landform that is mainly stratified alluvium with debris flow deposits in some areas. It is on the upper margin of a piedmont slope, and its apex is a source of alluvium debouching from a mountain valley into an intermontane basin. Also, a generic term for similar landforms in various other landscape positions.

**Alluvial flat.** The nearly level alluvial surface between a piedmont slope and the playa of a bolson or the axial-stream flood plain of a semibolson. This landform can include both recent and relict components.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Animal-unit-month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Area reclaim** (as a restrictive feature). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

**Back slope.** The slope component that is the steepest, straight to concave or merely concave, middle portion of an erosional slope.

**Badland.** Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

**Ballena.** A major landform comprising distinctively round-topped ridgeline remnants of fan alluvium. The broadly rounded shoulders of the ridge meet from either side to form a narrow crest and merge smoothly with the concave back slopes. In ideal examples, the slightly concave foot slopes of adjacent ballenas merge to form a smoothly rounded drainageway.

**Bar** (offshore and barrier). A component landform comprised of elongated, commonly curving, low ridges of well sorted sand and gravel that stand above the general level of a bolson floor. It is the result of the wave action of a Pleistocene lake.

**Basal area.** The area of a cross section of a tree. It is a measure of stand density, commonly expressed in square feet. For pinyon pine and juniper stands, it is the section at a height of 1 foot and is measured outside the bark.

**Base saturation.** The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

**Basin.** A general term for an intermontane basin, a

bolson, a semibolson, an area of centripetal drainage, or a structural depressional area.

**Basin floor.** The lowermost, nearly level major physiographic part of a bolson or semibolson. It includes all alluvial, eolian, and erosional landforms that are below the piedmont slopes.

**Basin-floor remnant.** A generally flat-topped erosional remnant of a basin floor that has been dissected by an axial stream.

**Beach plain.** A major landform of bolson floors comprised of numerous, closely spaced offshore bars and intervening lagoons. It is the result of a receding Pleistocene lake.

**Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

**Bolson.** An internally drained intermontane basin.

**Bolson floor.** The specific identification of the floor of a bolson, as compared with the floor of a semibolson; both are basin floors.

**Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.

**Brush management.** Use of mechanical, chemical, or biological methods to reduce or eliminate competition of woody vegetation to allow understory grasses and forbs to recover, or to make conditions favorable for reseeding. It increases production of forage, which reduces erosion. Brush management may improve the habitat for some species of wildlife.

**Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

**Canopy.** The leafy crown of trees or shrubs. (See Crown.)

**Cemented pan** (as a restrictive feature). A cemented pan is too close to the surface for the specified use.

**Channel.** The bed of a single or braided waterway that commonly is barren of vegetation. Channels form in young alluvium. They may be enclosed by banks, or they may be splayed across a fan surface and slightly mounded above it. They may include bars and dumps, consisting of cobbles and stones. Channels, except flood plain playas, are landform elements.

**Chemical treatment.** Control of unwanted vegetation by use of chemicals.

**Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter, in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

**Clay skin.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay film.

**Coarse textured soil.** Sand or loamy sand.

**Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

**Cobbly soil material.** Material that contains a specified amount of rounded or partially rounded rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. The percentage of these fragments, by volume, is expressed as:

|                        |              |
|------------------------|--------------|
| Cobbly .....           | 15 to 35     |
| Very cobbly .....      | 35 to 60     |
| Extremely cobbly ..... | more than 60 |

**Colluvium.** Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

**Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

**Component landform.** A feature of the Earth's surface that is part of a major landform and was created by partial dissection of the major landform or by alluvial or eolian accretion. A component landform is the smallest type of landform that can be described as a single unit. Its morphological parts are called landform elements, and a side slope element can be subdivided into slope components.

**Conglomerate.** A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer material. Conglomerate is the consolidated equivalent of gravel.

**Conservation cropping system.** Growing crops in combination with needed cultural and management practices. If soil improving crops and practices used in the system more than offset the soil depleting crops and deteriorating practices, then it is a good conservation cropping system. Cropping systems are needed on all tilled soils. Soil improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use

of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Consistence, soil.** The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

*Loose.*—Noncoherent when dry or moist; does not hold together in a mass.

*Friable.*—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

*Firm.*—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

*Plastic.*—Readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

*Sticky.*—Adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

*Hard.*—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

*Soft.*—When dry, breaks into powder or individual grains under very slight pressure.

*Cemented.*—Hard; little affected by moistening.

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Coppice dune.** A small dune of fine-earth soil material stabilized around shrubs or small trees.

**Corrosive.** High risk of corrosion to uncoated steel or deterioration of concrete.

**Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Crest.** The slope component comprising a very narrow, commonly linear top of an erosional ridge, hill, mountain, etc.

**Cropping system.** Growing crops using a planned system of rotation and management practices.

**Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

**Crown.** The upper part of a tree or shrub, including the living branches and their foliage.

**Cutbanks cave** (as a restrictive feature). The walls of excavations tend to cave in or slough.

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deep to water** (as a restrictive feature). The soil is deep to a permanent water table during dry periods.

**Deferred grazing.** Postponing grazing or arresting grazing for a prescribed period.

**Depth to rock** (as a restrictive feature). Bedrock is too near the surface for the specified use.

**Desert pavement.** A layer of gravel or coarser fragments on a desert soil surface that was emplaced by upward movement of fragments from underlying sediment or remains after finer particles have been removed by running water or wind.

**Desert varnish.** A glossy sheen or coating on stones and gravel in arid regions.

**Drainage class** (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

*Excessively drained.*—These soils have very high and high hydraulic conductivity and low water holding capacity. They are not suited for crop production unless irrigated.

*Somewhat excessively drained.*—These soils have high hydraulic conductivity and low water holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

*Well drained.*—These soils have intermediate water holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

*Moderately well drained.*—These soils are wet close enough to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless artificial drainage is provided. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

*Somewhat poorly drained.*—These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic

conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

**Poorly drained.**—These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

**Very poorly drained.**—These soils are wet to the surface most of the time. They are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Draw.** A small stream valley, generally more open and with broader bottom land than a ravine or gulch.

**Droughty** (as a restrictive feature). The soil holds too little water for plants during dry periods.

**Duff.** A term used to identify a generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

**Effervescence.** The quality of a soil measured when drops of diluted (1:10) hydrochloric acid (HCl) are added to the soil. The ratings are as follows:

Very slightly effervescent . . . . . few bubbles  
Slightly effervescent . . . . . bubbles readily  
Strongly effervescent . . . . . bubbles form low foam  
Violently  
effervescent . . . bubbles form thick foam quickly

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

**Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

**Erodes easily** (as a restrictive feature). Water erodes the soil easily.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

**Erosion** (geologic). Erosion caused by geologic

processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

**Erosion** (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or other animal activities or of a catastrophe in nature; for example, fire that exposes the surface.

**Erosion pavement.** A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

**Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and produced by erosion or faulting. Synonym: scarp.

**Excess fines** (as a restrictive feature). Excess silt and clay are in the soil. The soil does not provide a source of gravel or sand for use in construction.

**Excess salt** (as a restrictive feature). The soil has excess water-soluble salts that restrict the growth of most plants.

**Excess sodium** (as a restrictive feature). The soil has excess exchangeable sodium that restricts the growth of plants.

**Extrusive rock.** Igneous rock derived from deep-seated molten matter (magma) emplaced on the Earth's surface.

**Fan apron.** A component landform consisting of a sheetlike mantle of relatively young alluvium that partially covers the surface of an older fan piedmont or, in some places, an alluvial fan. A fan apron buries a pedogenic soil.

**Fan collar.** A component landform comprised of a thin, short, relatively young mantle of alluvium along the very upper margin of a major alluvial fan at a mountain front. The mantle somewhere buries a pedogenic soil that can be traced to the edge of the fan collar where it emerges as the land surface, or relict soil.

**Fan piedmont.** The most extensive major landform of most piedmont slopes. It is formed by the lateral coalescence of mountain-front alluvial fans into one generally smooth slope and by accretion of fan aprons. Fan piedmonts commonly are complexes of many component landforms.

**Fan remnant.** A generic term for a component landform that is the remainder of various older fans that have been dissected (erosional fan remnants) or partially buried (nonburied fan remnants). Erosional fan remnants have a flattish summit that consists of a relict fan surface; nonburied fan remnants consist entirely of a relict fan surface.

Fan remnants may be specifically identified as fan piedmont remnants, fan skirt remnants, inset fan remnants, etc.

**Fan remnant side slope.** A landform element comprised of the relatively young erosional slope around the sides of an erosional fan remnant. It is composed of shoulders, back slopes, and foot slopes.

**Fan skirt.** A major landform comprised of laterally coalescing, small alluvial fans that originate from gullies that are cut into or extend from inset fans of a fan piedmont and merge along their toe slopes with the basin floor. Fan skirts are smooth or only slightly dissected.

**Fast intake** (as a restrictive feature). The movement of water into the soil is rapid.

**Fibric soil material (peat).** The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

**Fine textured soil.** Sandy clay, silty clay, or clay.

**Flooding** (as a restrictive feature). The soil is flooded by moving water from stream overflow, runoff, or high tides.

**Flood plain.** The transversely level floor of an axial stream of a semibolson or of a major desert stream valley that is occasionally or regularly alluviated by the stream overflowing its channel during periods of flooding.

**Flood plain playa.** A component landform consisting of very low gradient, barren, axial stream segments in an intermontane basin. It is subject to broad and shallow floods and is veneered with barren, fine textured sediment that crusts. A flood plain playa commonly is segmented by transverse, narrow bands of vegetation, and it may alternate with ordinary, narrow or braided channel segments.

**Foothill.** A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

**Foot slope.** The relatively gently sloping, slightly concave slope component of an erosional slope that is at the base of the back slope component. Synonym: pediment.

**Forb.** Any herbaceous plant not a grass or a sedge.

**Frost action** (as a restrictive feature). The moisture in the soil freezes and thaws. Frost action can damage roads, buildings, and other structures.

**Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

**Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

**Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

**Gravelly soil material.** Material that contains a specified amount of rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter. The amount of these fragments, by volume, is expressed as—

|                         |                      |
|-------------------------|----------------------|
| Gravelly.....           | 15 to 35 percent     |
| Very gravelly .....     | 35 to 60 percent     |
| Extremely gravelly..... | more than 60 percent |

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by silica or calcium carbonate.

**Hard rock.** Rock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

**Hard to pack** (as a restrictive feature). The soil is difficult to compact.

**Hemic soil material (mucky peat).** Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

**Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well-defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:  
*O horizon.*—An organic layer of fresh and decaying plant residue.

*A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*B horizon.*—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C

horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*E horizon.*—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*C horizon.*—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the number 2 precedes the letter C.

*R layer.*—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors of predicting runoff. The four hydrologic groups are:

*Group A.*—Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

*Group B.*—Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

*Group C.*—Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

*Group D.*—Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

**Igneous rock.** Rock formed by solidification from a molten or partially molten state. Major varieties

include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Inset fan.** The flood plain of a commonly ephemeral stream that is confined between fan remnants, basin floor remnants, ballenas, or closely opposed fan toe slopes. Its transversely level cross section is evidence of alluviation of a fluvial. It is wide enough that raw channels cover only a fraction of its surface.

**Intermittent stream.** A stream, or reach of a stream, that flows for prolonged periods only when it receives ground water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Irrigation.** Application of water to soils to assist in production of crops.

**Lacustrine deposit (geology).** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Lake plain.** A major landform of some bolson floors that is nearly level and consists of fine textured, stratified bottom sediment of a Pleistocene lake.

**Lake plain terrace.** A somewhat elevated area and component landform of a lake plain.

**Landform element.** The morphological part of a component landform. Side slope landform elements may be divided into slope components.

**Large stones (as a restrictive feature).** The soil has rock fragments that are 3 inches (7.5 centimeters) in diameter or more.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.

**Low strength.** The soil is not strong enough to support loads.

**Major landform.** A subdivision of the piedmont slope or basin floor major physiographic part that reflects a major morphogenetic process taking place over a long period of time or that is the result of a special erosional or depositional process. Many major



landforms are dissected, and their original area is occupied by component landforms.

**Major physiographic part.** The very large part of an intermontane basin that is characterized by dominant slope and position and is comprised of major landforms (i.e., steeply sloping mountains that stand above less sloping piedmonts that in turn grade to nearly level basin floors).

**Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Mountain.** A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides and considerable bare-rock surface. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

**Mountain valley fan.** A major landform that is the result of alluvial filling of a mountain valley or intramontane basin by coalescent valley-side slope fans whose toe slopes meet from either side of the valley along an axial drainageway. It is an extension of the upper piedmont slope into

mountain valleys. Most mountain valley fans have been dissected.

**Mudstone.** Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

**Munsell notation.** A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color in hue of 10YR, value of 6, and chroma of 4.

**Neutral soil.** A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Observed rooting depth.** Depth to which roots have been observed to penetrate.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition.

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan* or *claypan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pediment.** The foot slope component of an erosional slope.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Percs slowly** (as a restrictive feature). The slow movement of water through the soil, adversely affecting the specified use.

**Permeability.** The quality of the soil that enables water to move downward through the profile.

Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

|                        |                        |
|------------------------|------------------------|
| Very slow .....        | less than 0.06 inch    |
| Slow .....             | 0.06 to 0.2 inch       |
| Moderately slow .....  | 0.2 to 0.6 inch        |
| Moderate .....         | 0.6 inch to 2.0 inches |
| Moderately rapid ..... | 2.0 to 6.0 inches      |
| Rapid .....            | 6.0 to 20 inches       |
| Very rapid .....       | more than 20 inches    |

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piping** (as a restrictive feature). Water moving through the soil forms subsurface tunnels or pipelike cavities.

**Plain.** A flat, undulating or rolling area, large or small, that includes few prominent hills or valleys. It generally is at a low elevation in relation to surrounding areas, and it may have considerable overall slope and local relief.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plateau.** An extensive upland mass with a relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

**Playa.** An ephemerally flooded, barren area on a basin floor that is veneered with fine textured sediment and acts as a temporary or final sink for drainage water.

**Ponding.** Standing water on soils in closed depressional areas. The water can be removed only by percolation or evapotranspiration.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Poor outlets** (as a restrictive feature). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

**Potential native plant community.** The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

**Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning.** The application of fire to land under such conditions of weather, soil moisture, and time of day as presumably will result in the intensity of heat and spread required to accomplish specific forest management, wildlife, grazing, or fire hazard reduction purposes.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This increases the vigor and reproduction of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Range condition.** The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Range site.** An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

|                              |                |
|------------------------------|----------------|
| Extremely acid .....         | below 4.5      |
| Very strongly acid .....     | 4.5 to 5.0     |
| Strongly acid .....          | 5.1 to 5.5     |
| Medium acid .....            | 5.6 to 6.0     |
| Slightly acid .....          | 6.1 to 6.5     |
| Neutral .....                | 6.6 to 7.3     |
| Mildly alkaline .....        | 7.4 to 7.8     |
| Moderately alkaline .....    | 7.9 to 8.4     |
| Strongly alkaline .....      | 8.5 to 9.0     |
| Very strongly alkaline ..... | 9.1 and higher |

**Relict.** Old, or remaining from previous times; in the present context, of Pleistocene age.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Remnant.** The remainder of a larger landform or of a land surface that has been dissected or partially buried.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material

that accumulated as consolidated rock disintegrated in place.

**Ridgeline remnant.** A narrow ridge that has a fully rounded crest and is accordant with the crests of similar, nearby ridges. Together these accordant crests approximately mark the position of a pre-existing land surface that has been destroyed by dissection.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rooting depth** (as a restrictive feature). The soil is shallow to a layer that greatly restricts roots; shallow root zone.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water. Six classes of runoff are recognized:

*Ponded.*—Little of the precipitation and run-on escapes as runoff, and free water stands on the surface for significant periods. The amount of water that must be removed from ponded areas by movement through the soil, by plants, or by evaporation is usually greater than the total rainfall. Ponding normally occurs in level to nearly level depressional areas, and the water depth may fluctuate greatly.

*Very slow.*—Surface water flows away slowly, and free water stands on the surface for long periods or immediately enters the soil. Most of the water passes through the soil, is used by plants, or evaporates. The soils commonly are level or nearly level or are very open and porous.

*Slow.*—Surface water flows away slowly enough that free water stands on the surface for moderate periods or enters the soil rapidly. Most of the water passes through the soil, is used by plants, or evaporates. The soils commonly are either nearly level or very gently sloping or they are steeper but absorb precipitation very rapidly.

*Medium.*—Surface water flows away fast enough that free water stands on the surface for only short periods. Part of the precipitation enters the soil and is used by plants, is lost by evaporation, or moves into underground channels. The soils commonly are either nearly level or gently sloping and absorb precipitation at a moderate rate or they are steeper but absorb water rapidly.

*Rapid.*—Surface water flows away fast enough that

the period of concentration is brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly moderately steep or steep, and they have a moderate to slow rate of absorption.

*Very rapid.*—Surface water flows away so fast that the period of concentration is very brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly steep or very steep, and they absorb precipitation slowly.

**Run-on.** Soil moisture received as runoff from adjacent areas.

**Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium. The conductivity of extract, in millimhos per centimeter, is expressed as:

|                         |              |
|-------------------------|--------------|
| Nonsaline .....         | 0 to 4       |
| Slightly saline .....   | 4 to 8       |
| Moderately saline ..... | 8 to 16      |
| Strongly saline .....   | more than 16 |

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sand dune.** A component landform made up of eolian, sand-sized mineral particles. Dunes commonly are on the leeward side of a Pleistocene lakebed.

**Sand sheet.** A major landform comprising an extensive, several-foot-thick layer of eolian sand from pluvial lake beaches, sometimes partly redeposited by water. It is spread across alluvial flats, onto piedmont slopes, or even over low mountains and has an undulating and commonly duned surface.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Sapric soil material (muck).** The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Seepage** (as a restrictive feature). The movement of water through the soil. Seepage adversely affects the specified use of the soil.

**Semibolson.** An externally drained intermontane basin.

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the substratum. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Shoulder.** The convex slope component at the top of an erosional side slope.

**Shrink-swell** (as a restrictive feature). The soil shrinks when dry and swells when wet.

**Side slope.** The erosional slope around the sides of an erosional fan remnant, hill, ballena, mountain, etc. It is composed of shoulders, back slopes, foot slopes, and toe slopes. Also, the planimetrically linear parts of the slopes around a digitally dissected fan remnant or hill, or other landform, as compared with the planimetrically convex nose slope and concave head slope parts.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Site index.** A designation of the quality of a forest site. For pinyon pine and juniper stands, it is based on tree diameter at a height of 1 foot height and the spacing between trees.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

|                          |                      |
|--------------------------|----------------------|
| Nearly level .....       | 0 to 2 percent       |
| Gently sloping .....     | 2 to 4 percent       |
| Moderately sloping ..... | 4 to 8 percent       |
| Strongly sloping .....   | 8 to 15 percent      |
| Moderately steep .....   | 15 to 30 percent     |
| Steep .....              | 30 to 50 percent     |
| Very steep .....         | 50 to 75 percent     |
| Extremely steep .....    | more than 75 percent |

**Slope** (as a restrictive feature). The slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specified use.

**Slope component.** A morphological element of an

erosional slope and a morphological subdivision of the side slope landform element.

**Slow intake** (as a restrictive feature). The slow movement of water into the soil.

**Small stones** (as a restrictive feature). The soil has rock fragments that are less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca}^{++} + \text{Mg}^{++}$ . The degrees of sodicity and their respective ratios are:

|                        |              |
|------------------------|--------------|
| Nonsodic .....         | less than 13 |
| Slightly sodic .....   | 13 to 25     |
| Moderately sodic ..... | 25 to 46     |
| Strongly sodic .....   | more than 46 |

**Soft rock.** Rock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil blowing** (as a restrictive feature). The soil is easily moved by wind.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

|                        |                 |
|------------------------|-----------------|
| Very coarse sand ..... | 2.0 to 1.0      |
| Coarse sand .....      | 1.0 to 0.5      |
| Medium sand .....      | 0.5 to 0.25     |
| Fine sand .....        | 0.25 to 0.10    |
| Very fine sand .....   | 0.10 to 0.05    |
| Silt .....             | 0.05 to 0.002   |
| Clay .....             | less than 0.002 |

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the substratum. The living roots and plant and animal activities are largely confined to the solum.

**Stones.** Rock fragments 10 to 24 inches (25 to 60

centimeters) in diameter if rounded or 6 to 15 inches (15 to 38 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Stony soil material.** Material, commonly a subsurface layer, that contains a specified amount of rock fragments that are mainly 10 to 24 inches in diameter. The amount of these fragments, by volume, is expressed as:

|                       |                      |
|-----------------------|----------------------|
| Stony .....           | 15 to 35 percent     |
| Very stony .....      | 35 to 60 percent     |
| Extremely stony ..... | more than 60 percent |

**Stream terrace.** A transversely level erosional remnant of a former axial stream or major desert stream flood plain that slopes in the same direction as the adjacent, incised stream and is underlain by well-sorted, stratified sand and gravel or by loamy or clayey sediment.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Substratum.** The part of the soil below the solum.

**Summit.** The flattish top of an erosional fan remnant, hill, mountain, or other landform. The term is used for both a landform element and a slope component.

**Tail water.** The water just downstream of a structure.

**Talus.** Rock fragments of any size or shape, commonly coarse and angular, derived from and lying at the base of a cliff or very steep, rock slope. The accumulated mass of such loose, broken rock formed chiefly by falling, rolling, or sliding.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

**Terrace.** Any part of a general slope that stands above a short, steep scarp and has a generally flat, nearly level or gently sloping summit. It may have another short scarp above the summit. Synonym: bench.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Thin layer** (as a restrictive feature). Otherwise suitable soil material too thin for the specified use.

**Toe slope.** The lowest part of a foot slope component of an erosional slope. It is distinguished from the upper part of a foot slope by a greater accumulation of pediment. Also, the lowest and most gently sloping part of a slope.

**Too arid** (as a restrictive feature). The soil is dry most of the time, and vegetation is difficult to establish.

**Too clayey** (as a restrictive feature). The soil is slippery and sticky when wet and is slow to dry.

**Too sandy** (as a restrictive feature). The soil is soft and loose; it is droughty and low in fertility.

**Tuff.** A compacted deposit that is 50 percent or more volcanic ash and dust.

**Valley.** An elongated depressional area cut by stream erosion and the associated water erosion of its side slopes (stream valley). Also used for intermontane basins.

**Variant, soil.** A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

**Variegation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Water-supplying capacity.** The total amount of water available in the soil for plant growth in a normal year from precipitation, from run-on, and from a capillary fringe minus runoff.

**Water table.** The upper level of ground water or that level below which the soil is saturated.

**Water table (perched).** The water table of a saturated layer of soil that is separated from an underlying saturated layer by an unsaturated layer.

**Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the Earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

**Wetness** (as a restrictive feature). The soil is wet during the period of use.



# Appendix

---

**Criteria Used in Rating Soils for Selected Uses**  
**Daily Cover for Landfill**

| Property                                                                      | Limits |                       |                                                  | Restrictive feature |
|-------------------------------------------------------------------------------|--------|-----------------------|--------------------------------------------------|---------------------|
|                                                                               | Good   | Fair                  | Poor                                             |                     |
| 1. USDA texture .....                                                         | ---    | ---                   | Ice                                              | Permafrost.         |
| 2. Depth to bedrock (inches) .....                                            | >60    | 40-60                 | <40                                              | Depth to rock.      |
| 3. Depth to cemented pan (inches) ..                                          | >60    | 40-60                 | <40                                              | Cemented pan.       |
| 4. Unified <sup>1</sup> .....                                                 | ---    | ---                   | SP, SW, SP-SM,<br>SW-SM, GP, GW,<br>GP-GM, GW-GM | Seepage.            |
| 5. USDA texture <sup>1 2 3</sup> .....                                        | ---    | CL, SICL, SC          | SIC, C                                           | Too clayey.         |
| 6. USDA texture <sup>1</sup> .....                                            | ---    | LCOS, LS,<br>LFS, VFS | S, FS, COS,<br>SG                                | Too sandy.          |
| 7. Unified <sup>1 2</sup> .....                                               | ---    | ---                   | OL, OH, CH,<br>MH                                | Hard to pack.       |
| 8. Coarse fragments (percent) <sup>1 4</sup> .....                            | <25    | 25-50                 | >50                                              | Small stones.       |
| 9. Fraction greater than 3 inches<br>(percent by weight) <sup>1 4</sup> ..... | <25    | 25-50                 | >50                                              | Large stones.       |
| 10. Slope (percent) .....                                                     | <8     | 8-15                  | >15                                              | Slope.              |
| 11. Depth to high water table (feet) ...                                      | ---    | ---                   | +                                                | Ponding.            |
|                                                                               | >3.5   | 1.5-3.5               | <1.5                                             | Wetness.            |
| 12. Unified <sup>1</sup> .....                                                | ---    | ---                   | PT                                               | Excess humus.       |
| 13. Layer thickness (inches) .....                                            | >60    | 40-60                 | <40                                              | Thin layer.         |
| 14. Soil reaction (pH) <sup>1</sup> .....                                     | ---    | ---                   | <3.6                                             | Too acid.           |
| 15. Salinity in the upper 60 inches<br>(mmhos/cm) <sup>3</sup> .....          | ---    | ---                   | >16                                              | Excess salt.        |
| 16. Sodium adsorption ratio<br>(great group) <sup>1 3</sup> .....             | ---    | ---                   | >12<br>(halic, natric, alkali<br>phases)         | Excess sodium.      |
| 17. Carbonates .....                                                          | ---    | ---                   | ( <sup>5</sup> )                                 | Excess lime.        |

<sup>1</sup> Thickest layer between 10 and 60 inches.

<sup>2</sup> If in kaolinitic family, rate one class better if experience confirms.

<sup>3</sup> Disregard in all Aridisols except Salorthids and Aquic intergrades and all Torri great groups of Entisols except Aquic.

<sup>4</sup> Sum (100 minus percent passing No. 10 sieve) and fraction greater than 3 inches. Use dominant condition for restrictive feature.

<sup>5</sup> If the amount of carbonate is so high that it restricts the growth of plants, rate "Poor—excess lime."



## Shallow Excavations

| Property                                                                    | Limits                    |                 |                                                      | Restrictive feature |
|-----------------------------------------------------------------------------|---------------------------|-----------------|------------------------------------------------------|---------------------|
|                                                                             | Slight                    | Moderate        | Severe                                               |                     |
| 1. USDA texture .....                                                       | ---                       | ---             | Ice                                                  | Permafrost.         |
| 2. Depth to bedrock (inches):                                               |                           |                 |                                                      |                     |
| Hard .....                                                                  | >60                       | 40-60           | <40                                                  | Depth to rock.      |
| Soft .....                                                                  | >40                       | 20-40           | <20                                                  | Depth to rock.      |
| 3. Depth to cemented pan (inches):                                          |                           |                 |                                                      |                     |
| Thick .....                                                                 | >60                       | 40-60           | <40                                                  | Cemented pan.       |
| Thin .....                                                                  | >40                       | 20-40           | <20                                                  | Cemented pan.       |
| 4. USDA texture (20 to 60 inches) ...                                       | ---                       | SI <sup>1</sup> | COS, S, FS,<br>VFS, LCOS, LS,<br>LFS, LVFS, G,<br>SG | Cutbanks cave.      |
| 5. USDA texture (20 to 60 inches) ...                                       | ---                       | C, SIC          | ---                                                  | Too clayey.         |
| 6. Soil order .....                                                         | ---                       | ---             | Vertisols                                            | Cutbanks cave.      |
| 7. Bulk density (g/cc) .....                                                | ---                       | >1.8            | ---                                                  | Dense layer.        |
| 8. Unified (20 to 60 inches) .....                                          | ---                       | ---             | OL, OH, PT                                           | Excess humus.       |
| 9. Fraction greater than 3 inches<br>(percent by weight) <sup>2</sup> ..... | <25                       | 25-50           | >50                                                  | Large stones.       |
| 10. Depth to high water table (feet) ...                                    | ---                       | ---             | +                                                    | Ponding.            |
|                                                                             | >6                        | 2.5-6           | 0-2.5                                                | Wetness.            |
| 11. Flooding .....                                                          | None, rare,<br>protected. | Common          | ---                                                  | Flooding.           |
| 12. Slope (percent) .....                                                   | 0-8                       | 8-15            | >15                                                  | Slope.              |

<sup>1</sup> In areas of loess, rating should be *slight*.

<sup>2</sup> Weighted average to 40 inches.

## Local Roads and Streets

| Property                                                                     | Limits              |          |               | Restrictive feature |
|------------------------------------------------------------------------------|---------------------|----------|---------------|---------------------|
|                                                                              | Slight              | Moderate | Severe        |                     |
| 1. USDA texture .....                                                        | ---                 | ---      | Ice           | Permafrost.         |
| 2. Depth to bedrock (inches):                                                |                     |          |               |                     |
| Hard .....                                                                   | >40                 | 20-40    | <20           | Depth to rock.      |
| Soft .....                                                                   | >20                 | <20      | ---           | Depth to rock.      |
| 3. Depth to cemented pan (inches):                                           |                     |          |               |                     |
| Thick .....                                                                  | >40                 | 20-40    | <20           | Cemented pan.       |
| Thin .....                                                                   | >20                 | <20      | ---           | Cemented pan.       |
| 4. AASHTO group index number <sup>1 2</sup>                                  | 0-4                 | 5-8      | >8            | Low strength.       |
| 5. AASHTO <sup>1 3</sup> .....                                               | ---                 | A-4, A-5 | A-6, A-7, A-8 | Low strength.       |
| 6. Depth to high water table (feet) ...                                      |                     |          |               |                     |
| ---                                                                          | ---                 | ---      | +             | Ponding.            |
| >2.5                                                                         | >2.5                | 1.0-2.5  | 0-1.0         | Wetness.            |
| 7. Slope (percent) .....                                                     | 0-8                 | 8-15     | >15           | Slope.              |
| 8. Flooding .....                                                            | None,<br>protected. | Rare     | Common        | Flooding.           |
| 9. Potential frost action .....                                              | Low                 | Moderate | High          | Frost action.       |
| 10. Shrink-swell potential <sup>1</sup> .....                                | Low                 | Moderate | High          | Shrink-swell.       |
| 11. Fraction greater than 3 inches<br>(percent by weight) <sup>4</sup> ..... | <25                 | 25-50    | >50           | Large stones.       |

<sup>1</sup> Thickest layer between 10 and 40 inches.

<sup>2</sup>  $GIN = (F-35)[.2 + .005(LL-40)] + .01 (F-15)(PI-10)$  where F = percent passing No. 200 sieve. If F is <35 and PI is >11, use only part 2 of equation. Use median values.

<sup>3</sup> Use AASHTO classification only when group index is not known.

<sup>4</sup> Weighted average to 40 inches.

**Roadfill**

| Property                                                                    | Limits |          |                    | Restrictive feature |
|-----------------------------------------------------------------------------|--------|----------|--------------------|---------------------|
|                                                                             | Good   | Fair     | Poor               |                     |
| 1. USDA texture.....                                                        | ---    | ---      | Ice                | Permafrost.         |
| 2. Depth to bedrock (inches) .....                                          | >60    | 40-60    | <40                | Area reclaim.       |
| 3. AASHTO group index number <sup>1 2</sup> ...                             | 0-4    | 5-8      | >8                 | Low strength.       |
| 4. AASHTO <sup>2 3</sup> .....                                              | ---    | A-4      | A-5, A-6, A-7, A-8 | Low strength.       |
| 5. Layer thickness (inches).....                                            | >60    | 30-60    | <30                | Thin layer.         |
| 6. Fraction greater than 3 inches<br>(percent by weight) <sup>4</sup> ..... | <25    | 25-50    | >50                | Large stones.       |
| 7. Depth to high water table (feet) ....                                    | >3     | 1-3      | <1                 | Wetness.            |
| 8. Slope (percent) .....                                                    | 0-15   | 15-25    | >25                | Slope.              |
| 9. Shrink-swell potential <sup>2</sup> .....                                | Low    | Moderate | High               | Shrink-swell.       |

<sup>1</sup> GIN = (F-35)[.2 + .005(LL-40)] + .01 (F-15)(PI-10) where F = percent passing No. 200 sieve. If F is <35 and PI is >11, use only part 2 of equation. Use median values.

<sup>2</sup> Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

<sup>3</sup> Use AASHTO classification only when group index is not known.

<sup>4</sup> Weighted average to 40 inches.

**Sand**

| Property                                                                    | Limits                            |                                   | Restrictive feature |
|-----------------------------------------------------------------------------|-----------------------------------|-----------------------------------|---------------------|
|                                                                             | Probable source                   | Improbable source                 |                     |
| 1. Unified <sup>1</sup> .....                                               | SW, SP, SW-SM, SP-SM              | ---                               | ---                 |
|                                                                             | GW, GP, GW-GM, GP-GM <sup>2</sup> | ---                               | ---                 |
|                                                                             | ---                               | GW, GP, GW-GM, GP-GM <sup>3</sup> | Small stones.       |
|                                                                             | ---                               | All other                         | Excess fines.       |
| 2. Layer thickness (inches) ....                                            | ---                               | <36                               | Thin layer.         |
|                                                                             | >36                               | ---                               | ---                 |
| 3. Fraction greater than 3 inches<br>(percent by weight) <sup>4</sup> ..... | ---                               | >50                               | Large stones.       |
|                                                                             | <50                               | ---                               | ---                 |

<sup>1</sup> Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

<sup>2</sup> Percent passing No. 4 sieve minus percent passing No. 200 sieve is greater than 25.

<sup>3</sup> Percent passing No. 4 sieve minus percent passing No. 200 sieve is less than 25.

<sup>4</sup> Thickest layer between 10 and 60 inches.

**Gravel**

| Property                                                                    | Limits                                                    |                                          | Restrictive feature                 |
|-----------------------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------|-------------------------------------|
|                                                                             | Probable source                                           | Improbable source                        |                                     |
| 1. Unified <sup>1</sup> .....                                               | GW, GP, GW-GM, GP-GM<br>SW, SP, SW-SM, SP-SM <sup>2</sup> | ---<br>SW, SP, SW-SM, SP-SM <sup>3</sup> | ---<br>Too sandy.                   |
| 2. Layer thickness .....                                                    | ---<br>>36                                                | All other<br><36<br>---                  | Excess fines.<br>Thin layer.<br>--- |
| 3. Fraction greater than 3 inches<br>(percent by weight) <sup>4</sup> ..... | ---<br><50                                                | >50<br>---                               | Large stones.<br>---                |

<sup>1</sup> Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

<sup>2</sup> 100 minus percent passing No. 4 sieve is greater than 25.

<sup>3</sup> 100 minus percent passing No. 4 sieve is less than 25.

<sup>4</sup> Thickest layer between 10 and 60 inches.

## Topsoil

| Property                                                                        | Limits |                            |                                       | Restrictive feature |
|---------------------------------------------------------------------------------|--------|----------------------------|---------------------------------------|---------------------|
|                                                                                 | Good   | Fair                       | Poor                                  |                     |
| 1. USDA texture .....                                                           | ---    | ---                        | Ice                                   | Permafrost.         |
| 2. Depth to bedrock (inches) .....                                              | >40    | 20-40                      | <20                                   | Depth to rock.      |
| 3. Depth to cemented pan (inches) ..                                            | >40    | 20-40                      | <20                                   | Cemented pan.       |
| 4. Depth to bulk density greater than 1.8 g/cc (inches) .....                   | >40    | 20-40                      | <20                                   | Area reclaim.       |
| 5. USDA texture <sup>1</sup> .....                                              | ---    | LCOS, LS, LFS, LVFS        | COS, S, FS, VFS                       | Too sandy.          |
| 6. USDA texture <sup>1</sup> .....                                              | ---    | SCL, CL, SICL <sup>2</sup> | SIC, C, SC                            | Too clayey.         |
| 7. USDA texture <sup>1</sup> .....                                              | ---    | ---                        | FB, HM, SP, MPT, muck, peat, CE       | Excess humus.       |
| 8. Fraction greater than 3 inches (percent by weight): <sup>3</sup>             |        |                            |                                       |                     |
| 0 to 40 inches .....                                                            | <5     | 5-25                       | >25                                   | Large stones.       |
| 40 to 60 inches .....                                                           | <15    | 15-30                      | >30                                   | Area reclaim.       |
| 9. Coarse fragments (percent): <sup>3</sup>                                     |        |                            |                                       |                     |
| 0 to 40 inches .....                                                            | <5     | 5-25                       | >25                                   | Small stones.       |
| 40 to 60 inches .....                                                           | <25    | 25-50                      | >50                                   | Area reclaim.       |
| 10. Salinity (mmhos/cm) <sup>1</sup> .....                                      | <4     | 4-8                        | >8                                    | Excess salt.        |
| 11. Layer thickness (inches) .....                                              | >40    | 20-40                      | <20                                   | Thin layer.         |
| 12. Depth to high water table (feet) ...                                        | ---    | ---                        | <1                                    | Wetness.            |
| 13. Sodium adsorption ratio in the upper 40 inches (great group or phase) ..... | ---    | ---                        | >12<br>(halic, natric, alkali phases) | Excess sodium.      |
| 14. Soil reaction (pH) <sup>1</sup> .....                                       | ---    | ---                        | <3.6                                  | Too acid.           |
| 15. Slope (percent) .....                                                       | <8     | 8-15                       | >15                                   | Slope.              |
| 16. Carbonates .....                                                            | ---    | ---                        | ( <sup>4</sup> )                      | Excess lime.        |

<sup>1</sup> Thickest layer between 0 and 40 inches.

<sup>2</sup> If soil contains more than 3 percent organic matter and has less than 35 percent clay, rate *good*.

<sup>3</sup> Sum (100 minus percent passing No. 10 sieve) and fraction greater than 3 inches. Use dominant condition for restrictive feature.

<sup>4</sup> If the amount of carbonate is so high that it restricts the growth of plants, rate "Poor—excess lime."

**Pond Reservoir Areas**

| Property                                                     | Limits |          |                  | Restrictive feature |
|--------------------------------------------------------------|--------|----------|------------------|---------------------|
|                                                              | Slight | Moderate | Severe           |                     |
| 1. USDA texture. ....                                        | ---    | ---      | Ice              | Permafrost.         |
| 2. Permeability between 20 and 60 inches (inches/hour) ..... | <0.6   | 0.6-2.0  | >2.0             | Seepage.            |
| 3. Depth to bedrock (inches) .....                           | >60    | 20-60    | <20              | Depth to rock.      |
| 4. Depth to cemented pan (inches) . . .                      | >60    | 20-60    | <20              | Cemented pan.       |
| 5. Slope (percent) .....                                     | <3     | 3-8      | >8               | Slope.              |
| 6. USDA texture (all depths) .....                           | ---    | ---      | Marl, gyp        | Seepage.            |
| 7. Downslope movement .....                                  | ---    | ---      | ( <sup>1</sup> ) | Slippage.           |
| 8. Formation of pits .....                                   | ---    | ---      | ( <sup>2</sup> ) | Pitting.            |

<sup>1</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate "Severe—slippage."

<sup>2</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the surface cover is removed, rate "Severe—pitting."

## Embankments, Dikes, and Levees

| Property                                                                    | Limits |                                  |                                                                          | Restrictive feature |
|-----------------------------------------------------------------------------|--------|----------------------------------|--------------------------------------------------------------------------|---------------------|
|                                                                             | Slight | Moderate                         | Severe                                                                   |                     |
| 1. USDA texture .....                                                       | ---    | ---                              | Ice                                                                      | Permafrost.         |
| 2. Layer thickness (inches) .....                                           | >60    | 30-60                            | <30                                                                      | Thin layer.         |
| 3. Unified <sup>1</sup> .....                                               | ---    | ---                              | GW, GP, SW, SP,<br>GW-GM, GP-GM,<br>SW-SM, SP-SM,<br>SM, <sup>2</sup> GM | Seepage.            |
| 4. Unified <sup>1</sup> .....                                               | ---    | GM, <sup>3</sup> CL <sup>4</sup> | ML, <sup>5</sup> SM, <sup>6</sup> SP,<br>CL-ML                           | Piping.             |
| 5. Unified <sup>1</sup> .....                                               | ---    | ---                              | PT, OL, OH                                                               | Excess humus.       |
| 6. Unified <sup>1</sup> .....                                               | ---    | ---                              | MH, CH <sup>7</sup>                                                      | Hard to pack.       |
| 7. Fraction greater than 3 inches<br>(percent by weight) <sup>8</sup> ..... | <15    | 15-35                            | >35                                                                      | Large stones.       |
| 8. Depth to high water table (feet) ...                                     | ---    | ---                              | +                                                                        | Ponding.            |
| Apparent .....                                                              | >4     | 2-4                              | <2                                                                       | Wetness.            |
| Perched .....                                                               | >3     | 1-3                              | <1                                                                       | Wetness.            |
| 9. Sodium adsorption ratio<br>(great group) .....                           | ---    | ---                              | >12<br>(natric, halic)                                                   | Excess sodium.      |
| 10. Salinity (mmhos/cm) .....                                               | <8     | 8-16                             | >16                                                                      | Excess salt.        |

<sup>1</sup> Thickest layer between 10 and 60 inches.

<sup>2</sup> Rate *moderate* if more than 20 percent passing No. 200 sieve and *slight* if more than 30 percent passing No. 200 sieve.

<sup>3</sup> Rate *slight* if less than 35 percent passing No. 200 sieve, less than 50 percent passing No. 40 sieve, and less than 65 percent passing No. 10 sieve. The soil must meet all three criteria before it is rated *slight*.

<sup>4</sup> Rate *slight* if PI is greater than 15.

<sup>5</sup> Rate *moderate* if PI is greater than 10.

<sup>6</sup> Rate *moderate* if less than 70 percent passing No. 40 sieve and less than 90 percent passing No. 10 sieve, and rate *slight* if less than 60 percent passing No. 40 sieve and less than 75 percent passing No. 10 sieve.

<sup>7</sup> Rate *moderate* if PI is less than 40.

<sup>8</sup> Weighted average to 40 inches.



## Range Seeding

| Property                                                   | Limits                                                                     |                                                                                                            |                                                                                                     | Restrictive feature            |
|------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------|
|                                                            | Good                                                                       | Fair                                                                                                       | Poor                                                                                                |                                |
| 1. Moisture regime .....                                   | Aquic, xeric, ustic, and xeric and ustic bordering on aridic or torric.    | Aridic and torric bordering on aquic, xeric or ustic.                                                      | Aridic and torric.                                                                                  | Too arid.                      |
| 2. Effective moisture <sup>1</sup> .....                   | >10 in. (25 cm)                                                            | 7-10 in. (17.5-25 cm)                                                                                      | <7 in. (17.5 cm)                                                                                    | Too arid.                      |
| 3. Available water capacity .....                          | Surface 10 in. (27 cm) >1.25 in. (3.2 cm). Soil profile > 4 in. (10.2 cm). | Surface 10 in. (25 cm) 0.75-1.25 in. (1.9-3.2 cm). Soil profile 2.5-4 in. (6.4-10.2 cm).                   | Surface 10 in. (25 cm) <0.75 in. (1.9 cm). Soil profile < 2-5 in. (6.4 cm).                         | Droughty.                      |
| 4. Texture surface 7 in. (17.5 cm)                         | LVFS, COSL, SL, FSL, VFSL, L SIL, SCL, and CL SiCL with <35% C.            | VFS, LFS, SC, SIC, C and CL and SiCL with >35% C.                                                          | LS, LCOS, FS, COS.                                                                                  | Too sandy.<br>Too clayey.      |
| 5. Rock fragments in surface 7 in. (17.5 cm) .....         | GR <35%; CB <15%; ST <3%. Total rock fragments <35%.                       | GR <35%; CB 15-35%; ST 3-15%. Total rock fragments <35%.                                                   | GR >35%; CB 35%; ST >15%. Total rock fragments >35%.                                                | Small stones.<br>Large stones. |
| 6. Depth to abrupt A-B texture boundary <sup>2</sup> ..... | >10 in. (25 cm)                                                            | >10 in. (25 cm)                                                                                            | <10 in. (25 cm)                                                                                     | Rooting depth.                 |
| 7. Depth to bedrock or hardpan ..                          | >20 in. (50 cm)                                                            | 10-20 in. (25-50 cm)                                                                                       | <10 in. (25 cm)                                                                                     | Depth to rock/pan.             |
| 8. Electrical conductivity-saturation extract-25°C .....   | <2 mmhos/cm (0.2 s/m) in upper 20 in. (50 cm).                             | 2-4 mmhos/cm (0.2-0.4 s/m) in upper 10 in. (25 cm) and 4-8 mmhos/cm (0.4-0.8 s/m) in 10-20 in. (25-50 cm). | >4 mmhos/cm (0.4 s/m) in upper 10 in. (25 cm) and/or >8 mmhos/cm (0.8 s/m) in 10-20 in. (25-50 cm). | Excess salt.                   |
| 9. Sodium adsorption ratio .....                           | <8 in upper 20 in. (50 cm).                                                | 8-13 in upper 10 in. (25 cm) and <20 in 10-20 in. (25-50 cm).                                              | >13 in upper 10 in. (25 cm) and/or >20 in 10-20 in. (25-50 cm).                                     | Excess sodium.                 |
| 10. K x % slope <sup>3</sup> .....                         | <4 <sup>4</sup> ; <6 <sup>5</sup>                                          | 4-6 <sup>4</sup> ; 6-8 <sup>5</sup>                                                                        | >6 <sup>4</sup> ; >8 <sup>5</sup>                                                                   | Erodes easily.                 |
| 11. I x C <sup>6</sup> .....                               | <60                                                                        | <60                                                                                                        | >60                                                                                                 | Soil blowing.                  |
| 12. Soil surface morphological types <sup>7</sup> .....    | Types I and II >60%; Type IV <5%; or with mollic epipedon <sup>8</sup>     | Types I and II 20-60%; Type IV <10% <sup>8</sup>                                                           | Type III <60%; Type IV >10% <sup>8</sup>                                                            | Too crusty.                    |

<sup>1</sup> Moisture from precipitation, run-on, and ground water budgeted to actual evapotranspiration.<sup>2</sup> Rate Vertisols and Vertic subgroups as poor.<sup>3</sup> Sheet and rill erosion hazard (bare soil).<sup>4</sup> For ustic bordering on aridic or torric, and aridic or torric bordering on ustic moisture regimes.<sup>5</sup> For xeric, xeric bordering on aridic or torric, and aridic or torric bordering on xeric moisture regimes.<sup>6</sup> Wind erosion hazard (bare soil).<sup>7</sup> See: (a) Final Report. Properties, Occurrence and Management of Soils with Vesicular Surface Horizons, 1977. Contract No. 52500-CT 5(N). USDI-BLM and UNR-Ag. Exp. Sta. Eckert, Peterson, Wood, and Blackburn; and (b) Final Report. Properties, Occurrence and Management of Soils with Vesicular Surface Horizons—Effects of Trampling on Seeding Emergence. 1979. Contract No. YA 512-CT 7-14. USDI-BLM and UNR-Ag. Exp. Sta. Stephens, Eckert, and Peterson.<sup>8</sup> Soils without crusting morphology are to be included in Types I and II for rating.

### Guide for Estimating the Hazard of Erosion on Bare Soil in Nevada

("K" means erosion factor K; "S" means percent slope; "I" means wind erodibility index; "C" means climatic factor)

|                | Water<br>(K x S) | Wind<br>(I x C) |
|----------------|------------------|-----------------|
| Slight.....    | <4               | <60             |
| Moderate ..... | 4-8              | 60-100          |
| High.....      | >8               | >100            |

# Tables

---

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-78)

| Month               | Temperature                 |                             |         |                                            |                                           |                                                    | Precipitation |                              |                |                                                           |                     |
|---------------------|-----------------------------|-----------------------------|---------|--------------------------------------------|-------------------------------------------|----------------------------------------------------|---------------|------------------------------|----------------|-----------------------------------------------------------|---------------------|
|                     | Average<br>daily<br>maximum | Average<br>daily<br>minimum | Average | 2 years in<br>10 will have--               |                                           | Average<br>number of<br>growing<br>degree<br>days* | Average       | 2 years in 10<br>will have-- |                | Average<br>number of<br>days with<br>0.10 inch<br>or more | Average<br>snowfall |
|                     |                             |                             |         | Maximum<br>temperature<br>higher<br>than-- | Minimum<br>temperature<br>lower<br>than-- |                                                    |               | Less<br>than--               | More<br>than-- |                                                           |                     |
|                     |                             |                             |         | ° F                                        | ° F                                       |                                                    |               | In                           | In             |                                                           | In                  |
| AUSTIN:             | ° F                         | ° F                         | ° F     | ° F                                        | ° F                                       | Units                                              | In            | In                           | In             |                                                           | In                  |
| January----         | 41.0                        | 19.0                        | 30.0    | 61                                         | -8                                        | 10                                                 | 1.02          | 0.45                         | 1.50           | 4                                                         | 12.1                |
| February----        | 43.9                        | 21.8                        | 32.9    | 63                                         | 0                                         | 40                                                 | 1.17          | .47                          | 1.75           | 5                                                         | 12.6                |
| March-----          | 47.8                        | 23.8                        | 35.8    | 69                                         | 3                                         | 67                                                 | 1.33          | .41                          | 2.06           | 4                                                         | 13.6                |
| April-----          | 54.8                        | 29.0                        | 41.9    | 77                                         | 12                                        | 161                                                | 1.68          | .42                          | 2.67           | 5                                                         | 17.5                |
| May-----            | 65.6                        | 37.5                        | 51.6    | 87                                         | 19                                        | 379                                                | 1.36          | .38                          | 2.15           | 4                                                         | 6.0                 |
| June-----           | 76.5                        | 45.6                        | 61.0    | 95                                         | 29                                        | 630                                                | 1.35          | .36                          | 2.15           | 3                                                         | .5                  |
| July-----           | 87.3                        | 53.9                        | 70.6    | 98                                         | 40                                        | 949                                                | .62           | .12                          | 1.00           | 2                                                         | .0                  |
| August-----         | 84.9                        | 52.2                        | 68.6    | 96                                         | 36                                        | 887                                                | .68           | .06                          | 1.14           | 2                                                         | .0                  |
| September--         | 76.2                        | 44.7                        | 60.5    | 92                                         | 25                                        | 615                                                | .70           | .05                          | 1.19           | 2                                                         | .2                  |
| October----         | 64.8                        | 36.0                        | 50.4    | 84                                         | 15                                        | 348                                                | .87           | .08                          | 1.43           | 2                                                         | 3.6                 |
| November---         | 50.3                        | 26.7                        | 38.6    | 70                                         | 5                                         | 76                                                 | .94           | .39                          | 1.40           | 3                                                         | 5.9                 |
| December---         | 41.7                        | 20.4                        | 31.1    | 59                                         | -4                                        | 24                                                 | 1.18          | .28                          | 1.89           | 5                                                         | 12.6                |
| Yearly:             |                             |                             |         |                                            |                                           |                                                    |               |                              |                |                                                           |                     |
| Average----         | 61.2                        | 34.2                        | 47.8    | ---                                        | ---                                       | ---                                                | ---           | ---                          | ---            | ---                                                       | ---                 |
| Extreme----         | ---                         | ---                         | ---     | 98                                         | -9                                        | ---                                                | ---           | ---                          | ---            | ---                                                       | ---                 |
| Total-----          | ---                         | ---                         | ---     | ---                                        | ---                                       | 4,186                                              | 12.90         | 10.31                        | 16.53          | 41                                                        | 84.6                |
| BATTLE<br>MOUNTAIN: |                             |                             |         |                                            |                                           |                                                    |               |                              |                |                                                           |                     |
| January----         | 41.3                        | 16.2                        | 28.7    | 62                                         | -16                                       | 36                                                 | .58           | .23                          | .88            | 3                                                         | 4.9                 |
| February----        | 47.6                        | 21.7                        | 34.7    | 68                                         | -2                                        | 54                                                 | .56           | .17                          | .88            | 2                                                         | 4.2                 |
| March-----          | 53.4                        | 24.3                        | 38.9    | 76                                         | 3                                         | 86                                                 | .61           | .15                          | .98            | 3                                                         | 3.6                 |
| April-----          | 61.8                        | 29.4                        | 45.6    | 83                                         | 12                                        | 198                                                | .79           | .21                          | 1.25           | 3                                                         | 3.1                 |
| May-----            | 72.3                        | 38.0                        | 55.2    | 94                                         | 19                                        | 477                                                | .77           | .12                          | 1.27           | 3                                                         | .4                  |
| June-----           | 82.1                        | 45.6                        | 63.8    | 99                                         | 29                                        | 714                                                | 1.04          | .22                          | 1.68           | 3                                                         | .0                  |
| July-----           | 93.0                        | 51.7                        | 72.4    | 104                                        | 39                                        | 1,004                                              | .26           | .04                          | .43            | 1                                                         | .0                  |
| August-----         | 90.4                        | 48.2                        | 69.3    | 103                                        | 31                                        | 908                                                | .34           | ---                          | .62            | 1                                                         | .0                  |
| September--         | 81.0                        | 39.1                        | 60.1    | 97                                         | 21                                        | 603                                                | .47           | ---                          | .80            | 1                                                         | .0                  |
| October----         | 68.5                        | 29.7                        | 49.2    | 87                                         | 12                                        | 295                                                | .57           | ---                          | .99            | 2                                                         | .2                  |
| November---         | 52.2                        | 22.0                        | 37.2    | 73                                         | 0                                         | 62                                                 | .57           | .20                          | .87            | 2                                                         | 1.9                 |
| December---         | 41.8                        | 15.9                        | 28.9    | 61                                         | -14                                       | 22                                                 | .77           | .26                          | 1.19           | 3                                                         | 6.5                 |
| Yearly:             |                             |                             |         |                                            |                                           |                                                    |               |                              |                |                                                           |                     |
| Average----         | 65.5                        | 31.8                        | 48.7    | ---                                        | ---                                       | ---                                                | ---           | ---                          | ---            | ---                                                       | ---                 |
| Extreme----         | ---                         | ---                         | ---     | 104                                        | -19                                       | ---                                                | ---           | ---                          | ---            | ---                                                       | ---                 |
| Total-----          | ---                         | ---                         | ---     | ---                                        | ---                                       | 4,459                                              | 7.33          | 5.34                         | 9.17           | 27                                                        | 24.8                |

\* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-78)

| Probability                          | Temperature       |                   |                   |
|--------------------------------------|-------------------|-------------------|-------------------|
|                                      | 24 °F<br>or lower | 28 °F<br>or lower | 32 °F<br>or lower |
| <b>AUSTIN:</b>                       |                   |                   |                   |
| Last freezing temperature in spring: |                   |                   |                   |
| 1 year in 10 later than--            | May 21            | June 8            | June 19           |
| 2 years in 10 later than--           | May 14            | June 2            | June 13           |
| 5 years in 10 later than--           | May 3             | May 21            | June 3            |
| First freezing temperature in fall:  |                   |                   |                   |
| 1 year in 10 earlier than--          | Sept. 27          | Sept. 17          | Sept. 5           |
| 2 years in 10 earlier than--         | Oct. 4            | Sept. 23          | Sept. 11          |
| 5 years in 10 earlier than--         | Oct. 18           | Oct. 4            | Sept. 23          |
| <b>BATTLE MOUNTAIN:</b>              |                   |                   |                   |
| Last freezing temperature in spring: |                   |                   |                   |
| 1 year in 10 later than--            | May 18            | June 4            | June 21           |
| 2 years in 10 later than--           | May 13            | May 28            | June 14           |
| 5 years in 10 later than--           | May 3             | May 15            | May 31            |
| First freezing temperature in fall:  |                   |                   |                   |
| 1 year in 10 earlier than--          | Sept. 16          | Sept. 3           | Aug. 26           |
| 2 years in 10 earlier than--         | Sept. 21          | Sept. 9           | Aug. 31           |
| 5 years in 10 earlier than--         | Oct. 1            | Sept. 20          | Sept. 11          |

TABLE 3.--GROWING SEASON  
(Recorded in the period 1951-78)

| Probability         | Daily minimum temperature<br>during growing season |                         |                         |
|---------------------|----------------------------------------------------|-------------------------|-------------------------|
|                     | Higher<br>than<br>24 °F                            | Higher<br>than<br>28 °F | Higher<br>than<br>32 °F |
|                     | <u>Days</u>                                        | <u>Days</u>             | <u>Days</u>             |
| AUSTIN:             |                                                    |                         |                         |
| 9 years in 10       | 138                                                | 112                     | 88                      |
| 8 years in 10       | 148                                                | 120                     | 96                      |
| 5 years in 10       | 168                                                | 136                     | 111                     |
| 2 years in 10       | 188                                                | 151                     | 127                     |
| 1 year in 10        | 198                                                | 159                     | 135                     |
| BATTLE<br>MOUNTAIN: |                                                    |                         |                         |
| 9 years in 10       | 129                                                | 99                      | 73                      |
| 8 years in 10       | 137                                                | 109                     | 83                      |
| 5 years in 10       | 151                                                | 127                     | 103                     |
| 2 years in 10       | 165                                                | 146                     | 122                     |
| 1 year in 10        | 173                                                | 155                     | 133                     |

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

| Map<br>symbol | Soil name                                                                     | Acres  | Percent |
|---------------|-------------------------------------------------------------------------------|--------|---------|
| 102           | Beowawe Variant-Tomera-Whirlo association-----                                | 3,265  | 0.2     |
| 112           | Millerlux-Reluctan-Cleavage association-----                                  | 2,305  | 0.1     |
| 120           | Alyan-Graley-Rock outcrop association-----                                    | 840    | 0.1     |
| 130           | Alley-Dewar association-----                                                  | 1,255  | 0.1     |
| 131           | Alley-Rock outcrop-Rubble land association-----                               | 5,965  | 0.4     |
| 140           | Antel silt loam-----                                                          | 2,165  | 0.1     |
| 141           | Antel silt loam, moderately sodic-----                                        | 395    | *       |
| 142           | Antel silty clay loam-----                                                    | 360    | *       |
| 143           | Antel silty clay loam, occasionally flooded-----                              | 2,890  | 0.2     |
| 150           | Argenta very fine sandy loam-----                                             | 3,885  | 0.2     |
| 152           | Argenta-Sonoma complex-----                                                   | 1,220  | 0.1     |
| 160           | Batan fine sandy loam-----                                                    | 1,185  | 0.1     |
| 161           | Batan silt loam-----                                                          | 15,700 | 1.1     |
| 162           | Batan silt loam, occasionally flooded-----                                    | 2,750  | 0.2     |
| 163           | Batan silt loam, slightly saline-----                                         | 1,635  | 0.1     |
| 164           | Batan-Raglan-Rosney association-----                                          | 4,920  | 0.3     |
| 166           | Batan-Wendane-Sonoma association-----                                         | 6,460  | 0.4     |
| 167           | Batan-Wendane-Valmy association-----                                          | 1,675  | 0.1     |
| 168           | Batan-Bubus-Ocala association-----                                            | 5,100  | 0.3     |
| 169           | Batan-Ocala-Ocala, rarely flooded, association-----                           | 2,150  | 0.1     |
| 170           | Beoska silt loam, 0 to 2 percent slopes-----                                  | 810    | 0.1     |
| 171           | Beoska silt loam, 2 to 8 percent slopes-----                                  | 22,000 | 1.5     |
| 172           | Beoska-Tenabo silt loams, nearly level-----                                   | 6,880  | 0.4     |
| 173           | Beoska-Tenabo silt loams, sloping-----                                        | 11,000 | 0.7     |
| 174           | Beoska-Chiara association-----                                                | 4,855  | 0.3     |
| 175           | Beoska-Jenor association-----                                                 | 4,840  | 0.3     |
| 177           | Beoska-Oxcord-McConnel association-----                                       | 5,405  | 0.3     |
| 178           | Beoska-Malpais-Old Camp association-----                                      | 3,525  | 0.2     |
| 181           | Beoska-Orovada association-----                                               | 5,380  | 0.3     |
| 182           | Beoska-Whirlo-Misad association-----                                          | 2,770  | 0.2     |
| 183           | Beoska-Dewar-Orovada association-----                                         | 2,195  | 0.1     |
| 185           | Beowawe silt loam-----                                                        | 385    | *       |
| 192           | Vanwyper-Trunk-Trunk, steep, association-----                                 | 13,760 | 0.9     |
| 193           | Berning-Alley association-----                                                | 2,365  | 0.1     |
| 200           | Sonoma Variant silt loam-----                                                 | 120    | *       |
| 202           | Bioya-Chiara-Cortez association-----                                          | 29,850 | 2.0     |
| 203           | Bioya-Shabliss-Puett association-----                                         | 4,490  | 0.3     |
| 211           | Blacka very fine sandy loam, 0 to 2 percent slopes-----                       | 1,335  | 0.1     |
| 212           | Blacka-Broyles very fine sandy loams, 2 to 8 percent slopes-----              | 4,150  | 0.3     |
| 213           | Blacka-Broyles very fine sandy loams, saline, 2 to 4 percent slopes-----      | 310    | *       |
| 220           | Blackhawk very fine sandy loam, 2 to 8 percent slopes-----                    | 1,290  | 0.1     |
| 230           | Broyles very fine sandy loam, 0 to 2 percent slopes-----                      | 12,410 | 0.8     |
| 231           | Broyles very fine sandy loam, 2 to 4 percent slopes-----                      | 10,000 | 0.7     |
| 232           | Broyles very fine sandy loam, cemented substratum, 0 to 2 percent slopes----- | 435    | *       |
| 233           | Broyles very fine sandy loam, moderately saline, 0 to 2 percent slopes-----   | 10,460 | 0.7     |
| 235           | Broyles-Creemon association-----                                              | 6,585  | 0.4     |
| 237           | Broyles-Beoska-Orovada association-----                                       | 6,800  | 0.4     |
| 240           | Bubus very fine sandy loam-----                                               | 9,655  | 0.6     |
| 242           | Bubus very fine sandy loam, gravelly substratum-----                          | 5,045  | 0.3     |
| 243           | Bubus-Playas complex-----                                                     | 2,530  | 0.2     |
| 244           | Bubus-Relley complex-----                                                     | 1,875  | 0.1     |
| 245           | Bubus-Needle Peak-Yipor association-----                                      | 940    | 0.1     |
| 247           | Bubus-Isolde association-----                                                 | 5,360  | 0.3     |
| 248           | Bubus-Batan-Reese association-----                                            | 4,630  | 0.3     |
| 251           | Bucan-Bucan, steep, association-----                                          | 1,965  | 0.1     |
| 252           | Bucan-Humdun-Rock outcrop association-----                                    | 2,050  | 0.1     |
| 262           | Chen-Slaven-Chen, cobbly, association-----                                    | 9,125  | 0.6     |
| 272           | Cherry Spring-Enko association-----                                           | 21,240 | 1.4     |
| 282           | Chiara-Orovada association-----                                               | 4,925  | 0.3     |
| 283           | Chiara-Tenabo association-----                                                | 4,165  | 0.3     |
| 284           | Chiara-Dewar association-----                                                 | 6,245  | 0.4     |
| 285           | Chiara-Trunk-Midraw association-----                                          | 2,725  | 0.2     |
| 286           | Chiara-Jenor association-----                                                 | 2,630  | 0.2     |

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

| Map<br>symbol | Soil name                                                                | Acres  | Percent |
|---------------|--------------------------------------------------------------------------|--------|---------|
| 290           | Creemon silt loam, 0 to 2 percent slopes-----                            | 20,005 | 1.4     |
| 291           | Creemon silt loam, 2 to 4 percent slopes-----                            | 3,665  | 0.2     |
| 292           | Creemon silt loam, 0 to 2 percent slopes, occasionally flooded-----      | 2,260  | 0.1     |
| 293           | Creemon silt loam, strongly saline, 0 to 2 percent slopes-----           | 4,075  | 0.3     |
| 294           | Creemon-Orovada-Broyles association-----                                 | 2,140  | 0.1     |
| 295           | Creemon-Cren association-----                                            | 2,955  | 0.2     |
| 296           | Creemon-Hessing association-----                                         | 3,515  | 0.2     |
| 297           | Creemon-Orovada-Tulase association-----                                  | 3,015  | 0.2     |
| 298           | Creemon-Misad association-----                                           | 1,580  | 0.1     |
| 300           | Cren silt loam-----                                                      | 4,415  | 0.3     |
| 303           | Cren-Doowak-Relley association-----                                      | 3,165  | 0.2     |
| 304           | Cren-Raglan-Batan association-----                                       | 4,420  | 0.3     |
| 310           | Davey fine sandy loam-----                                               | 740    | *       |
| 312           | Davey fine sandy loam, cemented substratum-----                          | 2,550  | 0.2     |
| 313           | Davey-Goldrun complex-----                                               | 2,835  | 0.2     |
| 340           | Duffer very fine sandy loam-----                                         | 1,685  | 0.1     |
| 370           | Enko fine sandy loam, 2 to 8 percent slopes-----                         | 8,000  | 0.5     |
| 371           | Enko-Shabliss-Orovada association-----                                   | 5,765  | 0.4     |
| 400           | Glean-Walti-Cleavage association-----                                    | 8,855  | 0.6     |
| 411           | Golconda-Blackhawk association-----                                      | 2,895  | 0.2     |
| 412           | Golconda-Dun Glen association-----                                       | 5,060  | 0.3     |
| 413           | Golconda-Blownout land complex-----                                      | 3,165  | 0.2     |
| 420           | Goldrun fine sand, 0 to 4 percent slopes-----                            | 180    | *       |
| 422           | Goldrun-Old Camp association-----                                        | 1,735  | 0.1     |
| 441           | Gund-Umberland association-----                                          | 595    | *       |
| 442           | Gund-Bubus-Wendane association-----                                      | 3,390  | 0.2     |
| 443           | Gund-Batan association-----                                              | 1,315  | 0.1     |
| 461           | Hapgood-Packer-Layview association-----                                  | 5,330  | 0.3     |
| 466           | Hapgood-Tusel-Winada association-----                                    | 7,545  | 0.5     |
| 467           | Hapgood-Sumine-Cleavage association-----                                 | 6,390  | 0.4     |
| 482           | Humdun-Havingdon-Bucan association-----                                  | 10,625 | 0.7     |
| 486           | Havingdon-Burrita association-----                                       | 1,930  | 0.1     |
| 511           | Hessing silt loam-----                                                   | 4,185  | 0.3     |
| 512           | Hessing-Relley association-----                                          | 2,884  | 0.2     |
| 530           | Humboldt fine sandy loam-----                                            | 225    | *       |
| 531           | Humboldt silty clay-----                                                 | 755    | *       |
| 532           | Humboldt silty clay loam, slightly saline-----                           | 220    | *       |
| 571           | Jenor-Blacka very fine sandy loams-----                                  | 1,410  | 0.1     |
| 573           | Jenor-Beoska-Broyles association-----                                    | 4,550  | 0.3     |
| 590           | Landco silt loam-----                                                    | 6,585  | 0.4     |
| 602           | Misad gravelly sandy loam, strongly saline-sodic-----                    | 240    | *       |
| 605           | Misad-Creemon-Rednik association-----                                    | 2,790  | 0.2     |
| 631           | McConnel-Tulase association-----                                         | 4,220  | 0.3     |
| 660           | Needle Peak silt loam, occasionally flooded-----                         | 300    | *       |
| 670           | Filiran-Pineval-Kingingham association-----                              | 1,830  | 0.1     |
| 680           | Skullwak-Umberland-Wendane association-----                              | 6,005  | 0.4     |
| 684           | Ocala silt loam, occasionally flooded-----                               | 2,620  | 0.2     |
| 700           | Orovada fine sandy loam, 0 to 2 percent slopes-----                      | 2,535  | 0.2     |
| 701           | Orovada fine sandy loam, 2 to 4 percent slopes-----                      | 7,490  | 0.5     |
| 702           | Orovada fine sandy loam, cemented substratum, 0 to 2 percent slopes----- | 1,785  | 0.1     |
| 703           | Orovada-Goldrun complex-----                                             | 580    | *       |
| 704           | Orovada-Kodra-Puett association-----                                     | 4,525  | 0.3     |
| 705           | Orovada-Creemon complex-----                                             | 1,745  | 0.1     |
| 706           | Orovada-Wieland-Chiara association-----                                  | 7,575  | 0.5     |
| 707           | Orovada-Goldrun association-----                                         | 11,000 | 0.7     |
| 708           | Orovada-Reina-Rock outcrop association-----                              | 1,800  | 0.1     |
| 709           | Orovada-Sodhouse association-----                                        | 750    | *       |
| 711           | Paranat silty clay loam-----                                             | 600    | *       |
| 713           | Paranat silty clay loam, drained-----                                    | 440    | *       |
| 714           | Paranat silty clay loam, occasionally flooded-----                       | 490    | *       |
| 731           | Yipor silt loam, moderately saline-sodic-----                            | 1,570  | 0.1     |
| 740           | Playas-----                                                              | 20,020 | 1.4     |
| 770           | Prida silt loam-----                                                     | 1,060  | 0.1     |

See footnote at end of table.



TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

| Map<br>symbol | Soil name                                                                   | Acres  | Percent |
|---------------|-----------------------------------------------------------------------------|--------|---------|
| 774           | Prida-Sonoma silty clay loams-----                                          | 955    | 0.1     |
| 780           | Pumper silt loam-----                                                       | 3,150  | 0.2     |
| 800           | Raglan silt loam, gravelly substratum-----                                  | 2,155  | 0.1     |
| 804           | Raglan silty clay loam, moderately saline-----                              | 460    | *       |
| 805           | Raglan silt loam-----                                                       | 570    | *       |
| 814           | Quarz-Linrose-Slaven association-----                                       | 4,655  | 0.3     |
| 816           | Quarz-Linrose-Cleavage association-----                                     | 2,080  | 0.1     |
| 830           | Reese silt loam-----                                                        | 4,715  | 0.3     |
| 835           | Reese-Ocala association-----                                                | 9,035  | 0.6     |
| 841           | Wendane Variant silt loam-----                                              | 180    | *       |
| 850           | Relley silt loam-----                                                       | 19,090 | 1.2     |
| 851           | Relley silt loam, cemented substratum-----                                  | 1,360  | 0.1     |
| 852           | Relley silt loam, strongly saline-----                                      | 2,355  | 0.1     |
| 853           | Relley silty clay loam-----                                                 | 820    | 0.1     |
| 855           | Relley-Broyles association-----                                             | 6,005  | 0.4     |
| 861           | Rixie silty clay loam, strongly saline-----                                 | 405    | *       |
| 862           | Rixie silty clay loam, drained, strongly saline-----                        | 3,760  | 0.2     |
| 863           | Rixie-Rixie, sodic, complex-----                                            | 265    | *       |
| 864           | Rixie silty clay loam-----                                                  | 590    | *       |
| 870           | Roca-Bregar-Linrose association-----                                        | 1,645  | 0.1     |
| 872           | Roca-Linrose-Wiskan association-----                                        | 3,640  | 0.2     |
| 873           | Roca-Reluctan association-----                                              | 4,250  | 0.3     |
| 875           | Roca-Glean-Bregar association-----                                          | 7,220  | 0.5     |
| 881           | Rose Creek silt loam, drained, strongly saline-----                         | 510    | *       |
| 882           | Rose Creek silty clay loam-----                                             | 1,140  | 0.1     |
| 883           | Rose Creek-Paranat silty clay loams-----                                    | 605    | *       |
| 891           | Rosney loam, cemented substratum-----                                       | 680    | *       |
| 892           | Rosney silt loam-----                                                       | 4,980  | 0.3     |
| 970           | Soolake very fine sandy loam, 0 to 2 percent slopes-----                    | 1,315  | 0.1     |
| 971           | Soolake very fine sandy loam, 2 to 8 percent slopes-----                    | 560    | *       |
| 972           | Soolake-Dunphy-Argenta association-----                                     | 8,450  | 0.5     |
| 980           | Sombrero very fine sandy loam-----                                          | 1,625  | 0.1     |
| 990           | Sonoma silt loam, drained-----                                              | 335    | *       |
| 991           | Sonoma silt loam, drained, slightly saline-----                             | 280    | *       |
| 992           | Sonoma silt loam, strongly saline, rarely flooded-----                      | 955    | 0.1     |
| 993           | Sonoma silty clay loam, frequently flooded-----                             | 6,955  | 0.4     |
| 994           | Sonoma silty clay loam, drained, strongly saline, occasionally flooded----- | 1,325  | 0.1     |
| 995           | Sonoma silty clay loam, strongly saline, occasionally flooded-----          | 1,875  | 0.1     |
| 996           | Sonoma, strongly saline-Sonoma complex-----                                 | 305    | *       |
| 997           | Sonoma silty clay loam, strongly saline, frequently flooded-----            | 305    | *       |
| 1021          | Susie Creek-Millerlux association-----                                      | 4,510  | 0.3     |
| 1031          | Teman silt loam-----                                                        | 5,345  | 0.3     |
| 1032          | Teman silt loam, clayey substratum-----                                     | 685    | *       |
| 1033          | Teman silt loam, strongly saline-----                                       | 620    | *       |
| 1040          | Tenabo, gravelly-Allor-Tenabo association-----                              | 3,380  | 0.2     |
| 1041          | Tenabo-Ricert association-----                                              | 9,630  | 0.6     |
| 1042          | Tenabo very gravelly loam, 2 to 8 percent slopes-----                       | 2,050  | 0.1     |
| 1062          | Tomera-Snapp-Whirlo association-----                                        | 5,190  | 0.3     |
| 1080          | Trunk-Burrita association-----                                              | 405    | *       |
| 1082          | Trunk-Reina association-----                                                | 5,485  | 0.3     |
| 1084          | Trunk-Burrita-Rock outcrop association-----                                 | 2,645  | 0.2     |
| 1085          | Trunk-Dewar-Stingdorn association-----                                      | 1,985  | 0.1     |
| 1086          | Trunk-Malpais-Minat association-----                                        | 4,055  | 0.3     |
| 1087          | Trunk-Burrita-Colbar association-----                                       | 4,290  | 0.3     |
| 1091          | Tulase silt loam, 2 to 8 percent slopes-----                                | 235    | *       |
| 1092          | Tulase-Bubus-McConnel association-----                                      | 1,785  | 0.1     |
| 1102          | Tweba very fine sandy loam, drained, 0 to 4 percent slopes-----             | 4,175  | 0.3     |
| 1110          | Umberland silty clay loam, ponded-----                                      | 630    | *       |
| 1140          | Wendane silt loam, frequently flooded-----                                  | 16,190 | 1.0     |
| 1141          | Wendane silt loam, sandy substratum-----                                    | 265    | *       |
| 1142          | Wendane-Tweba association-----                                              | 2,445  | 0.2     |
| 1143          | Wendane silt loam, occasionally flooded-----                                | 4,665  | 0.3     |
| 1144          | Wendane-Batan-Broyles association-----                                      | 6,000  | 0.4     |

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

| Map<br>symbol | Soil name                                                                     | Acres  | Percent |
|---------------|-------------------------------------------------------------------------------|--------|---------|
| 1145          | Wendane-Playas association-----                                               | 7,830  | 0.5     |
| 1146          | Wendane-Sonoma-Valmy association-----                                         | 1,955  | 0.1     |
| 1150          | Weso fine sandy loam-----                                                     | 8,680  | 0.5     |
| 1158          | Whirlo very fine sandy loam, 2 to 4 percent slopes, occasionally flooded----- | 260    | *       |
| 1160          | Whirlo gravelly loam, 2 to 8 percent slopes-----                              | 555    | *       |
| 1162          | Whirlo silt loam, 0 to 2 percent slopes-----                                  | 2,245  | 0.1     |
| 1163          | Whirlo silt loam, 2 to 4 percent slopes-----                                  | 2,635  | 0.2     |
| 1165          | Whirlo-Creemon association-----                                               | 4,105  | 0.3     |
| 1166          | Whirlo-Pumper silt loams-----                                                 | 475    | *       |
| 1168          | Whirlo-Oxcurel association-----                                               | 2,860  | 0.2     |
| 1169          | Whirlo-Broyles association-----                                               | 15,345 | 1.0     |
| 1170          | Wholan silt loam-----                                                         | 6,005  | 0.4     |
| 1174          | Wholan silt loam, sandy substratum-----                                       | 510    | *       |
| 1177          | Wholan, strongly alkaline-Rasille association-----                            | 3,885  | 0.2     |
| 1178          | Wholan-Rasille association-----                                               | 2,665  | 0.2     |
| 1201          | Slaven-Linrose-Cleavage association-----                                      | 7,865  | 0.5     |
| 1202          | Slaven-Wiskan-Graley Variant association-----                                 | 6,940  | 0.4     |
| 1203          | Slaven-Glean-Cleavage association-----                                        | 9,835  | 0.6     |
| 1212          | Wiskan-Roca-Bregar association-----                                           | 3,000  | 0.2     |
| 1215          | Wiskan-Locane association-----                                                | 4,170  | 0.3     |
| 1216          | Wiskan-Linrose association-----                                               | 2,710  | 0.2     |
| 1220          | Boulflat-Havingdon-Dewar association-----                                     | 4,470  | 0.3     |
| 1221          | Boulflat-Colbar-Old Camp association-----                                     | 5,220  | 0.3     |
| 1240          | Redflame-Kingingham association-----                                          | 4,170  | 0.3     |
| 1263          | Graley-Loncan-Bregar association-----                                         | 4,720  | 0.3     |
| 1280          | Ricert-Oxcurel-Whirlo association-----                                        | 2,920  | 0.2     |
| 1281          | Ricert-Whirlo-Pineval association-----                                        | 9,455  | 0.6     |
| 1283          | Ricert-Kingingham-Oxcurel association-----                                    | 4,870  | 0.3     |
| 1291          | Kingingham-Tenabo-Sodhouse association-----                                   | 6,865  | 0.4     |
| 1292          | Kingingham-Golconda-Whirlo association-----                                   | 12,540 | 0.8     |
| 1293          | Kingingham-Oxcurel association-----                                           | 9,325  | 0.6     |
| 1294          | Kingingham-Whirlo-Beoska association-----                                     | 4,630  | 0.3     |
| 1342          | Doowak, cobbly-Doowak-Veta association-----                                   | 1,435  | 0.1     |
| 1392          | Rock outcrop-Loncan Variant-Glean association-----                            | 2,060  | 0.1     |
| 1400          | Koynik, steep-Koynik-Rock outcrop association-----                            | 3,875  | 0.2     |
| 1410          | Bojo-Stingdorn association-----                                               | 7,165  | 0.5     |
| 1411          | Bojo-Rock outcrop-Osoll association-----                                      | 3,000  | 0.2     |
| 1412          | Bojo-Humdun-Boulflat association-----                                         | 920    | 0.1     |
| 1420          | Sumine-Reluctan-Cleavage association-----                                     | 25,325 | 1.7     |
| 1421          | Sumine-Softscrabble-Walti association-----                                    | 2,655  | 0.2     |
| 1422          | Sumine-Hapgood-Cleavage association-----                                      | 8,305  | 0.5     |
| 1423          | Sumine-Chen-Rock outcrop association-----                                     | 19,655 | 1.2     |
| 1425          | Sumine-Loncan association-----                                                | 2,020  | 0.1     |
| 1426          | Sumine-Cleavage-Loncan association-----                                       | 6,225  | 0.4     |
| 1427          | Sumine-Itca-Softscrabble association-----                                     | 2,435  | 0.2     |
| 1428          | Sumine-Rubble land-Cleavage association-----                                  | 2,900  | 0.2     |
| 1429          | Sumine-Winada Variant-Pernty association-----                                 | 6,560  | 0.4     |
| 1450          | Atlow, steep-Atlow-Stingdorn association-----                                 | 4,670  | 0.3     |
| 1451          | Atlow-Reluctan-Trunk association-----                                         | 2,225  | 0.1     |
| 1452          | Atlow-Minat-Old Camp association-----                                         | 2,385  | 0.2     |
| 1453          | Atlow-Colbar-Rock outcrop association-----                                    | 6,035  | 0.4     |
| 1532          | Cleavage-Rubble land-Bregar association-----                                  | 3,830  | 0.2     |
| 1542          | Linrose-Cleavage-Pernty association-----                                      | 3,870  | 0.2     |
| 1570          | Koynik Variant-Oxcurel-Whirlo association-----                                | 4,260  | 0.3     |
| 1600          | Dumps and Pits, mine-----                                                     | 4,575  | 0.3     |
| 1601          | Pits, gravel-----                                                             | 180    | *       |
| 1662          | Floer-Slaven-Roca association-----                                            | 2,670  | 0.2     |
| 1670          | Wieland-Allor association-----                                                | 15,170 | 1.0     |
| 1671          | Wieland-Oxcurel-Allor association-----                                        | 13,180 | 0.8     |
| 1673          | Wieland-Grassval-Puett association-----                                       | 1,385  | 0.1     |
| 1680          | Zineb gravelly loam, 2 to 8 percent slopes-----                               | 2,590  | 0.2     |
| 1682          | Zineb-Doowak-Oxcurel association-----                                         | 3,185  | 0.2     |
| 2060          | Oxcurel-Beoska-Whirlo association-----                                        | 19,360 | 1.2     |

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

| Map<br>symbol | Soil name                                                       | Acres  | Percent |
|---------------|-----------------------------------------------------------------|--------|---------|
| 2061          | Oxcorel-Whirlo-Dun Glen association-----                        | 6,960  | 0.4     |
| 2062          | Oxcorel-Orovada association-----                                | 7,540  | 0.5     |
| 2064          | Oxcorel-Misad association-----                                  | 5,165  | 0.3     |
| 2065          | Oxcorel-Oxcorel, moderately steep-Pineval association-----      | 5,515  | 0.3     |
| 2066          | Oxcorel-Broyles-Dun Glen association-----                       | 6,160  | 0.4     |
| 2067          | Oxcorel-Colbar-Stingdorn association-----                       | 3,970  | 0.2     |
| 2068          | Oxcorel-Golconda-Whirlo association-----                        | 13,805 | 0.9     |
| 2069          | Oxcorel-Rednik-Veta association-----                            | 5,045  | 0.3     |
| 2090          | Punchbowl-Robson-Reluctan association-----                      | 2,420  | 0.2     |
| 2091          | Punchbowl-Teguro-Sumine association-----                        | 5,610  | 0.4     |
| 2092          | Punchbowl-Belate-Reluctan association-----                      | 2,320  | 0.1     |
| 2094          | Punchbowl-Jung-Locane association-----                          | 1,625  | 0.1     |
| 2098          | Punchbowl-Clanlaine-Sumine association-----                     | 6,760  | 0.4     |
| 2099          | Punchbowl-Roca-Rock outcrop association-----                    | 3,115  | 0.2     |
| 2100          | Grassval-Grina-Unsel Variant association-----                   | 3,845  | 0.2     |
| 2104          | Grassval-Zineb-Izod association-----                            | 1,455  | 0.1     |
| 2521          | Stingdorn very cobbly loam, 4 to 30 percent slopes-----         | 3,915  | 0.2     |
| 2522          | Stingdorn-Stingdorn, steep-Colbar association-----              | 2,705  | 0.2     |
| 2530          | Perwick-Puett-Tulase association-----                           | 270    | *       |
| 2540          | Buffaran-Wieland association-----                               | 6,210  | 0.4     |
| 2541          | Buffaran-Zoesta association-----                                | 5,290  | 0.3     |
| 2550          | Laped-Old Camp-Colbar association-----                          | 3,125  | 0.2     |
| 2551          | Laped-Colbar-Osoll association-----                             | 2,447  | 0.2     |
| 2552          | Laped-Old Camp-Puett association-----                           | 9,065  | 0.6     |
| 2553          | Laped-Stingdorn-Colbar association-----                         | 10,260 | 0.6     |
| 2555          | Laped-Colbar association-----                                   | 2,800  | 0.2     |
| 2561          | Puett-Genaw-Orovada association-----                            | 2,225  | 0.1     |
| 2571          | Colbar, steep-Burrita-Colbar association-----                   | 5,815  | 0.4     |
| 2573          | Colbar-Midraw association-----                                  | 2,940  | 0.2     |
| 2575          | Colbar-Perwick-Settlemyer association-----                      | 1,610  | 0.1     |
| 2591          | Osoll Variant-Oxcorel association-----                          | 1,640  | 0.1     |
| 2600          | Grina-Caniwe-Handy association-----                             | 4,960  | 0.3     |
| 2602          | Grina-Grina, eroded-Caniwe association-----                     | 3,440  | 0.2     |
| 2620          | Handy-Caniwe-Zoesta association-----                            | 1,055  | 0.1     |
| 2621          | Handy, gravelly-Handy-Zoesta association-----                   | 2,415  | 0.2     |
| 2631          | Midraw-Minat-Pineval association-----                           | 3,935  | 0.2     |
| 2640          | Rasille-Kelk association-----                                   | 740    | *       |
| 2652          | Malpais-Stingdorn association-----                              | 2,210  | 0.1     |
| 2670          | Zoesta Variant-Jung-McVegas association-----                    | 2,115  | 0.1     |
| 2681          | Tessfive-Puett-Grina association-----                           | 3,775  | 0.2     |
| 2711          | Burrita-Burnborough association-----                            | 825    | 0.1     |
| 2712          | Burrita-Alley-Newpass association-----                          | 5,800  | 0.4     |
| 2721          | Burnborough-Sumine-Burrita association-----                     | 6,145  | 0.4     |
| 2760          | Ginex-Burrita-Burrita, south aspect, association-----           | 6,035  | 0.4     |
| 2771          | Kram-Hopeka-Rock outcrop association-----                       | 2,365  | 0.1     |
| 2783          | Desatoya, steep-Spike-Desatoya association-----                 | 410    | *       |
| 2790          | Old Camp-Minat-Osoll association-----                           | 3,525  | 0.2     |
| 2791          | Old Camp-Colbar-Rock outcrop association-----                   | 5,360  | 0.3     |
| 2793          | Old Camp-Laped association-----                                 | 5,335  | 0.3     |
| 2794          | Old Camp-Kram Variant-Rock outcrop association-----             | 6,465  | 0.4     |
| 2796          | Old Camp-Osoll-Colbar association-----                          | 8,010  | 0.5     |
| 2797          | Old Camp, steep-Colbar-Old Camp association-----                | 14,860 | 0.9     |
| 2798          | Old Camp-Atlow-Osoll association-----                           | 2,130  | 0.1     |
| 2800          | Old Camp-Walti-Softscrabble association-----                    | 7,574  | 0.5     |
| 2801          | Old Camp-Rock outcrop-Colbar association, strongly sloping----- | 6,780  | 0.4     |
| 2802          | Old Camp-Rock outcrop-Colbar association, steep-----            | 4,665  | 0.3     |
| 3071          | Allor-Wieland association-----                                  | 9,330  | 0.6     |
| 3111          | Ninemile-Zoesta-Itca association-----                           | 4,300  | 0.3     |
| 3121          | Walti-Softscrabble-Bucan association-----                       | 5,255  | 0.3     |
| 3122          | Walti-Sumine-Softscrabble association-----                      | 5,005  | 0.3     |
| 3127          | Walti-Cleavage-Softscrabble association-----                    | 7,550  | 0.5     |
| 3134          | Itca-Clanlaine-Sumine association-----                          | 5,425  | 0.3     |
| 3150          | Robson-Wiskan association-----                                  | 3,630  | 0.2     |

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

| Map<br>symbol | Soil name                                                       | Acres     | Percent |
|---------------|-----------------------------------------------------------------|-----------|---------|
| 3152          | Robson-Reluctan association-----                                | 10,285    | 0.7     |
| 3156          | Robson-Old Camp-Rock outcrop association-----                   | 2,410     | 0.2     |
| 3203          | Dewar-Sodhouse-Bojo association-----                            | 1,995     | 0.1     |
| 3410          | Zoesta-Wieland-Akerue association-----                          | 3,230     | 0.2     |
| 3413          | Zoesta-Reluctan association-----                                | 3,000     | 0.2     |
| 3415          | Zoesta-Handy association-----                                   | 2,995     | 0.2     |
| 3417          | Zoesta-Loncan-Welch association-----                            | 1,360     | 0.1     |
| 3420          | Belate-Sumine-Softscrabble association-----                     | 2,310     | 0.1     |
| 3423          | Belate-Cleavage-Softscrabble association-----                   | 2,310     | 0.1     |
| 3432          | Bregar-Roca-Quarz association-----                              | 5,065     | 0.3     |
| 3433          | Bregar-Punchbowl association-----                               | 3,625     | 0.2     |
| 3451          | Reluctan-Robson-Sumine association-----                         | 9,735     | 0.6     |
| 3452          | Reluctan-Sumine-Colbar association-----                         | 3,585     | 0.2     |
| 3453          | Reluctan-Locane-Itca association-----                           | 615       | *       |
| 3455          | Reluctan-Roca-Colbar association-----                           | 4,740     | 0.3     |
| 3560          | Locane-Robson-Bregar association-----                           | 3,025     | 0.2     |
| 3561          | Locane-Sumine-Glean association-----                            | 6,350     | 0.4     |
| 3564          | Locane-Zoesta-Bucan association-----                            | 3,585     | 0.2     |
| 3621          | Minat-Bojo-Stingdorn association-----                           | 1,515     | 0.1     |
| 3622          | Minat-Minat, eroded, association-----                           | 2,940     | 0.2     |
| 3624          | Minat-Colbar-Atlow association-----                             | 3,225     | 0.2     |
| 3650          | McVegas-Old Camp-Kingingham association-----                    | 2,550     | 0.2     |
| 3651          | McVegas-Beoska association-----                                 | 2,115     | 0.1     |
| 3652          | McVegas-Stingdorn-Colbar association-----                       | 7,405     | 0.5     |
| 3661          | Dun Glen-Whirlo association-----                                | 2,745     | 0.2     |
| 3690          | Izod-Koynik-Rock outcrop association-----                       | 2,700     | 0.2     |
| 3691          | Izod-Rock outcrop association-----                              | 2,075     | 0.1     |
| 3693          | Izod-Attella-Xine association-----                              | 1,970     | 0.1     |
| 3740          | Kelk silt loam, saline, 0 to 4 percent slopes-----              | 2,590     | 0.2     |
| 3741          | Kelk-Settlemyer association-----                                | 1,500     | 0.1     |
| 3742          | Kelk-Ocala association-----                                     | 4,515     | 0.3     |
| 3840          | Jung-Norfork-Buffaran association-----                          | 8,805     | 0.6     |
| 3841          | Jung-Itca-Roca association-----                                 | 5,730     | 0.4     |
| 3843          | Jung, steep-Robson-Jung association-----                        | 8,450     | 0.5     |
| 3845          | Jung-Stingdorn-Atlow association-----                           | 4,455     | 0.3     |
| 3846          | Jung-Wiskan association-----                                    | 4,635     | 0.3     |
| 3881          | Layview-Packer-Hapgood association-----                         | 1,035     | 0.1     |
| 3950          | Hooplite-Jung-Izod association-----                             | 565       | *       |
| 3961          | Pineval-Orovada-Beoska association-----                         | 5,740     | 0.4     |
| 3990          | Settlemyer fine sandy loam, drained, 0 to 4 percent slopes----- | 1,510     | 0.1     |
| 3992          | Settlemyer, drained-Settlemyer loams-----                       | 250       | *       |
| 4051          | Attella-Xine-Kram association-----                              | 5,205     | 0.3     |
| 4070          | Genaw-Wieland-Grina association-----                            | 4,230     | 0.3     |
| 4071          | Genaw-Perlor-Puett association-----                             | 11,740    | 0.7     |
| 4072          | Genaw-Orovada-Puett association-----                            | 1,565     | 0.1     |
| 4091          | Coztur-Genaw association-----                                   | 7,080     | 0.4     |
| 4093          | Coztur-Teguro-Punchbowl association-----                        | 4,395     | 0.3     |
| 4140          | Welch loam, drained, 2 to 8 percent slopes-----                 | 1,770     | 0.1     |
|               | Total-----                                                      | 1,588,530 | 100.0   |

\* Less than 0.1 percent.

TABLE 5.--ENGINEERING INDEX PROPERTIES

(The symbol &lt; means less than; &gt; means more than. Absence of an entry indicates that data were not estimated)

| Soil name and map symbol  | Depth | USDA texture                                                               | Classification       |               | Frag-ments<br>> 3 inches | Percentage passing sieve number-- |        |       |       | Liquid limit | Plas-ticity index |
|---------------------------|-------|----------------------------------------------------------------------------|----------------------|---------------|--------------------------|-----------------------------------|--------|-------|-------|--------------|-------------------|
|                           |       |                                                                            | Unified              | AASHTO        |                          | 4                                 | 10     | 40    | 200   |              |                   |
|                           | In    |                                                                            |                      |               | Pct                      |                                   |        |       |       | Pct          |                   |
| 102*:<br>Beowawe Variant- | 0-7   | Silt loam-----                                                             | ML                   | A-4           | 0-5                      | 90-100                            | 85-95  | 75-90 | 60-75 | 15-25        | NP-5              |
|                           | 7-25  | Gravelly clay loam.                                                        | GC, SC               | A-6, A-7      | 0-5                      | 65-80                             | 55-70  | 45-60 | 35-50 | 35-45        | 15-20             |
|                           | 25-60 | Extremely gravelly loamy sand.                                             | GP-GM                | A-1           | 0-10                     | 30-45                             | 15-25  | 10-20 | 5-10  | ---          | NP                |
| Tomera-----               | 0-8   | Gravelly loam----                                                          | SM, GM, SM-SC, GM-GC | A-2, A-4      | 0                        | 55-80                             | 50-75  | 35-70 | 25-50 | 20-30        | NP-10             |
|                           | 8-33  | Gravelly clay, clay, gravelly sandy clay.                                  | CH, SC               | A-7           | 0                        | 70-85                             | 55-80  | 45-75 | 35-60 | 50-65        | 25-35             |
|                           | 33-60 | Extremely gravelly sandy loam, very gravelly loamy sand, very cobbly loam. | GM                   | A-1           | 1-40                     | 40-50                             | 30-45  | 20-40 | 10-25 | ---          | NP                |
| Whirlo-----               | 0-7   | Gravelly sandy loam.                                                       | SM                   | A-2, A-4      | 0-10                     | 65-80                             | 60-75  | 40-55 | 25-40 | 15-25        | NP-5              |
|                           | 7-13  | Gravelly sandy loam, gravelly loam, fine sandy loam.                       | SM, GM               | A-2, A-4      | 0-10                     | 60-95                             | 55-85  | 40-60 | 25-50 | 15-25        | NP-5              |
|                           | 13-60 | Stratified very gravelly loam to extremely gravelly coarse sandy loam.     | GM                   | A-1, A-2      | 5-30                     | 45-60                             | 25-50  | 20-40 | 10-30 | 15-25        | NP-5              |
| 112*:<br>Millerlux-----   | 0-10  | Gravelly loam----                                                          | GM-GC, SM-SC         | A-4           | 5-10                     | 65-80                             | 55-70  | 45-60 | 35-50 | 15-25        | 5-10              |
|                           | 10-15 | Clay-----                                                                  | CH                   | A-7           | 0-10                     | 90-100                            | 85-100 | 80-95 | 60-75 | 50-65        | 25-40             |
|                           | 15-19 | Unweathered bedrock.                                                       | ---                  | ---           | ---                      | ---                               | ---    | ---   | ---   | ---          | ---               |
| Reluctan-----             | 0-13  | Gravelly loam----                                                          | SM-SC, CL-ML         | A-4           | 5-10                     | 70-80                             | 60-75  | 50-65 | 40-55 | 25-30        | 5-10              |
|                           | 13-38 | Gravelly clay loam, gravelly loam.                                         | GC, CL               | A-6, A-7      | 0-15                     | 65-85                             | 60-75  | 55-75 | 40-60 | 35-45        | 15-20             |
|                           | 38-42 | Unweathered bedrock.                                                       | ---                  | ---           | ---                      | ---                               | ---    | ---   | ---   | ---          | ---               |
| Cleavage-----             | 0-4   | Very gravelly loam.                                                        | GM-GC, GC            | A-2, A-4, A-6 | 0-10                     | 50-70                             | 30-50  | 25-45 | 20-40 | 25-35        | 5-15              |
|                           | 4-15  | Very cobbly clay loam, extremely gravelly clay loam, very gravelly loam.   | GC                   | A-2           | 0-45                     | 40-55                             | 30-45  | 25-45 | 20-35 | 30-45        | 10-20             |
|                           | 15-19 | Unweathered bedrock.                                                       | ---                  | ---           | ---                      | ---                               | ---    | ---   | ---   | ---          | ---               |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                          | Classification             |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|---------------------------------------------------------------------------------------|----------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                          |       |                                                                                       | Unified                    | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                          | In    |                                                                                       |                            |                  | Pct                             |                                      |       |       |       | Pct                    |                          |
| 120*:<br>Alyan-----      | 0-10  | Gravelly loam----                                                                     | GM-GC,<br>CL-ML,<br>GC, CL | A-2, A-4,<br>A-6 | 0-5                             | 55-80                                | 50-75 | 35-60 | 25-55 | 25-35                  | 5-15                     |
|                          | 10-16 | Clay-----                                                                             | CL, CH                     | A-7              | 0-5                             | 80-90                                | 75-85 | 65-80 | 50-65 | 45-60                  | 20-35                    |
|                          | 16-24 | Gravelly clay----                                                                     | GC, CL, CH                 | A-7              | 0-5                             | 55-80                                | 50-75 | 40-65 | 35-55 | 45-60                  | 20-35                    |
|                          | 24-28 | Unweathered<br>bedrock.                                                               | ---                        | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Graley-----              | 0-7   | Very gravelly<br>loam.                                                                | GM                         | A-1, A-2         | 0-5                             | 30-50                                | 25-45 | 20-40 | 15-30 | 20-25                  | NP-5                     |
|                          | 7-14  | Very gravelly<br>clay loam, very<br>gravelly clay.                                    | GC                         | A-2, A-7         | 0-25                            | 40-55                                | 35-50 | 30-50 | 25-40 | 45-55                  | 20-30                    |
|                          | 14    | Unweathered<br>bedrock.                                                               | ---                        | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Rock outcrop.            |       |                                                                                       |                            |                  |                                 |                                      |       |       |       |                        |                          |
| 130*:<br>Alley-----      | 0-3   | Cobbly fine sandy<br>loam.                                                            | SM                         | A-4              | 25-30                           | 85-95                                | 80-90 | 55-65 | 35-50 | 25-30                  | NP-5                     |
|                          | 3-16  | Gravelly clay<br>loam, gravelly<br>sandy clay loam,<br>gravelly loam.                 | SC, GC                     | A-6              | 0-10                            | 65-80                                | 55-75 | 50-65 | 35-50 | 30-35                  | 15-20                    |
|                          | 16-40 | Gravelly fine<br>sandy loam,<br>cobbly fine<br>sandy loam,<br>gravelly sandy<br>loam. | SM, GM                     | A-2, A-4         | 0-40                            | 60-85                                | 50-80 | 35-75 | 25-40 | 25-30                  | NP-5                     |
|                          | 40-60 | Very cobbly fine<br>sandy loam.                                                       | SM                         | A-2              | 30-45                           | 70-75                                | 60-70 | 45-55 | 25-35 | 25-30                  | NP-5                     |
| Dewar-----               | 0-4   | Very cobbly very<br>fine sandy loam.                                                  | SM-SC,<br>CL-ML            | A-4              | 40-50                           | 70-95                                | 65-80 | 55-75 | 40-55 | 25-30                  | 5-10                     |
|                          | 4-14  | Cobbly silty clay<br>loam.                                                            | CL                         | A-6, A-7         | 25-30                           | 85-95                                | 80-90 | 75-90 | 65-85 | 35-45                  | 15-20                    |
|                          | 14-60 | Indurated-----                                                                        | ---                        | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 131*:<br>Alley-----      | 0-3   | Very cobbly very<br>fine sandy loam.                                                  | GM-GC, GM,<br>SM-SC, SM    | A-2              | 30-40                           | 55-75                                | 50-70 | 45-65 | 25-35 | 20-30                  | NP-10                    |
|                          | 3-16  | Gravelly clay<br>loam, gravelly<br>sandy clay loam,<br>gravelly loam.                 | SC, GC                     | A-6              | 0-10                            | 65-80                                | 55-75 | 50-65 | 35-50 | 30-35                  | 15-20                    |
|                          | 16-40 | Gravelly fine<br>sandy loam,<br>cobbly fine<br>sandy loam,<br>gravelly sandy<br>loam. | SM, GM                     | A-2, A-4         | 0-40                            | 60-85                                | 50-80 | 35-75 | 25-40 | 25-30                  | NP-5                     |
|                          | 40-60 | Very cobbly fine<br>sandy loam.                                                       | SM                         | A-2              | 30-45                           | 70-75                                | 60-70 | 45-55 | 25-35 | 25-30                  | NP-5                     |
| Rock outcrop.            |       |                                                                                       |                            |                  |                                 |                                      |       |       |       |                        |                          |
| Rubble land.             |       |                                                                                       |                            |                  |                                 |                                      |       |       |       |                        |                          |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                         | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
|                          |       |                                                      | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                 |                          |
|                          | In    |                                                      |                |          | Pct                             |                                      |        |        |        | Pct             |                          |
| 140, 141-----<br>Antel   | 0-11  | Silt loam-----                                       | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-35           | 10-15                    |
|                          | 11-60 | Stratified very<br>fine sandy loam<br>to silty clay. | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 90-95  | 35-50           | 15-25                    |
| 142-----<br>Antel        | 0-11  | Silty clay loam                                      | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-40           | 15-20                    |
|                          | 11-60 | Stratified very<br>fine sandy loam<br>to silty clay. | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 90-95  | 35-50           | 15-25                    |
| 143-----<br>Antel        | 0-11  | Silty clay loam                                      | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-40           | 15-20                    |
|                          | 11-60 | Stratified very<br>fine sandy loam<br>to silty clay. | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 90-95  | 35-45           | 15-25                    |
| 150-----<br>Argenta      | 0-7   | Very fine sandy<br>loam.                             | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80  | 15-25           | NP-5                     |
|                          | 7-45  | Stratified fine<br>sandy loam to<br>silt loam.       | ML             | A-4      | 0                               | 100                                  | 90-100 | 80-95  | 50-65  | ---             | NP                       |
|                          | 45-60 | Gravelly sandy<br>loam.                              | SM             | A-1, A-2 | 0                               | 95-100                               | 55-65  | 35-45  | 20-30  | 15-25           | NP-5                     |
| 152*:<br>Argenta-----    | 0-7   | Very fine sandy<br>loam.                             | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80  | 15-25           | NP-5                     |
|                          | 7-45  | Stratified fine<br>sandy loam to<br>silt loam.       | ML             | A-4      | 0                               | 100                                  | 90-100 | 80-95  | 50-65  | ---             | NP                       |
|                          | 45-60 | Gravelly sandy<br>loam.                              | SM             | A-1, A-2 | 0                               | 95-100                               | 55-65  | 35-45  | 20-30  | 15-25           | NP-5                     |
| Sonoma-----              | 0-8   | Silty clay loam                                      | ML, CL         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50           | 10-25                    |
|                          | 8-60  | Stratified silt<br>loam to silty<br>clay loam.       | ML, CL         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50           | 10-25                    |
| 160-----<br>Batan        | 0-5   | Fine sandy loam                                      | SM, ML         | A-4      | 0                               | 100                                  | 100    | 70-85  | 40-55  | 15-20           | NP-5                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay loam.       | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40           | 15-25                    |
| 161-----<br>Batan        | 0-5   | Silt loam-----                                       | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-35           | 5-10                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay loam.       | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40           | 15-25                    |
| 162-----<br>Batan        | 0-5   | Silt loam-----                                       | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-35           | 5-10                     |
|                          | 5-40  | Stratified silt<br>loam to silty<br>clay loam.       | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40           | 15-25                    |
|                          | 40-60 | Stratified silt<br>loam to silty<br>clay loam.       | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40           | 15-25                    |
| 163-----<br>Batan        | 0-5   | Silt loam-----                                       | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-35           | NP-5                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay.            | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40           | 15-25                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                         | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|------------------------|--------------------------|
|                          |       |                                                      | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                        |                          |
|                          | In    |                                                      |                |          | Pct                             |                                      |        |        |        |                        |                          |
| 164*:<br>Batan-----      | 0-5   | Silt loam-----                                       | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-35                  | 5-10                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay loam.       | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40                  | 15-25                    |
| Raglan-----              | 0-6   | Silt loam-----                                       | CL-ML, ML      | A-4      | 0                               | 95-100                               | 95-100 | 85-95  | 75-85  | 25-35                  | 5-10                     |
|                          | 6-14  | Silt loam-----                                       | CL-ML, CL      | A-4, A-6 | 0                               | 95-100                               | 95-100 | 85-95  | 75-85  | 25-40                  | 5-15                     |
|                          | 14-60 | Stratified fine<br>sandy loam to<br>silty clay loam. | CL, ML         | A-4, A-6 | 0                               | 95-100                               | 95-100 | 85-95  | 70-80  | 30-40                  | 5-15                     |
| Rosney-----              | 0-7   | Silt loam-----                                       | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90  | 20-25                  | NP-5                     |
|                          | 7-25  | Silt loam-----                                       | CL-ML          | A-4      | 0                               | 100                                  | 100    | 95-100 | 80-95  | 20-30                  | 5-10                     |
|                          | 25-60 | Stratified silt<br>loam to silty<br>clay.            | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 15-20                    |
| 166*:<br>Batan-----      | 0-5   | Silt loam-----                                       | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-35                  | 5-10                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay loam.       | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40                  | 15-25                    |
| Wendane-----             | 0-13  | Silty clay loam                                      | CL, ML         | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 10-20                    |
|                          | 13-27 | Silt loam, very<br>fine sandy loam.                  | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80  | 30-40                  | NP-10                    |
|                          | 27-60 | Stratified silt<br>loam to clay<br>loam.             | CL, ML         | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 10-20                    |
| Sonoma-----              | 0-8   | Silty clay loam                                      | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-95  | 35-50                  | 15-25                    |
|                          | 8-60  | Stratified silt<br>loam to silty<br>clay loam.       | CL, ML         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50                  | 10-25                    |
| 167*:<br>Batan-----      | 0-5   | Silt loam-----                                       | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-35                  | 5-10                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay loam.       | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40                  | 15-25                    |
| Wendane-----             | 0-8   | Silt loam-----                                       | ML, CL-ML      | A-4      | 0                               | 100                                  | 100    | 95-100 | 75-90  | 25-35                  | 5-10                     |
|                          | 8-60  | Silty clay loam,<br>silt loam.                       | ML, CL-ML      | A-4      | 0                               | 100                                  | 100    | 95-100 | 80-95  | 25-35                  | 5-10                     |
| Valmy-----               | 0-6   | Very fine sandy<br>loam.                             | SM             | A-4      | 0                               | 90-100                               | 85-100 | 65-75  | 35-50  | 15-25                  | NP-5                     |
|                          | 6-46  | Fine sandy loam                                      | SM, ML         | A-4      | 0                               | 90-100                               | 85-100 | 70-80  | 40-55  | 15-25                  | NP-5                     |
|                          | 46-60 | Silty clay loam                                      | ML             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-95  | 35-45                  | 10-15                    |
| 168*:<br>Batan-----      | 0-5   | Silt loam-----                                       | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-35                  | 5-10                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay loam.       | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40                  | 15-25                    |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol   | Depth | USDA texture                                                                    | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-------------------------------|-------|---------------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                               |       |                                                                                 | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                               | In    |                                                                                 |                |          | Pct                             |                                      |        |        |       | Pct             |                          |
| 168*:<br>Bubus-----           | 0-6   | Very fine sandy loam.                                                           | ML             | A-4      | 0                               | 85-95                                | 75-90  | 70-80  | 50-60 | 25-30           | NP-5                     |
|                               | 6-60  | Stratified sandy loam to silt loam.                                             | ML             | A-4      | 0                               | 95-100                               | 90-100 | 80-90  | 50-60 | 25-30           | NP-5                     |
| Ocala-----                    | 0-13  | Silt loam-----                                                                  | ML, CL         | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-40           | 5-15                     |
|                               | 13-60 | Silt loam, silty clay loam.                                                     | ML, CL         | A-6, A-7 | 0                               | 90-100                               | 90-100 | 90-95  | 85-90 | 30-50           | 10-20                    |
| 169*:<br>Batan-----           | 0-5   | Silt loam-----                                                                  | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-35           | 5-10                     |
|                               | 5-68  | Stratified silt loam to silty clay loam.                                        | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-40           | 15-25                    |
| Ocala-----                    | 0-13  | Silty clay loam                                                                 | CL, ML         | A-7      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 40-50           | 15-20                    |
|                               | 13-60 | Silt loam, silty clay loam.                                                     | ML, CL         | A-6, A-7 | 0                               | 90-100                               | 90-100 | 90-95  | 85-90 | 30-50           | 10-20                    |
| Ocala, rarely<br>flooded----- | 0-6   | Silty clay loam                                                                 | CL, ML         | A-7      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 40-50           | 15-20                    |
|                               | 6-13  | Silt loam, silty clay loam.                                                     | ML, CL         | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-50           | 10-20                    |
|                               | 13-60 | Silt loam, silty clay loam.                                                     | ML, CL         | A-6, A-7 | 0                               | 90-100                               | 90-100 | 90-95  | 85-90 | 30-50           | 10-20                    |
| 170, 171-----<br>Beoska       | 0-13  | Silt loam-----                                                                  | ML             | A-4      | 0                               | 85-95                                | 75-85  | 70-80  | 55-70 | 30-35           | NP-5                     |
|                               | 13-24 | Silt loam, silty clay loam.                                                     | CL             | A-6, A-7 | 0                               | 80-100                               | 75-100 | 70-85  | 60-85 | 35-45           | 15-25                    |
|                               | 24-55 | Stratified gravelly very fine sandy loam to gravelly sandy loam.                | GM, SM         | A-1, A-2 | 0-10                            | 55-80                                | 50-75  | 30-50  | 20-35 | 15-25           | NP-5                     |
|                               | 55-60 | Stratified very gravelly sandy loam to extremely gravelly very fine sandy loam. | GM             | A-1      | 0-15                            | 30-55                                | 25-50  | 15-35  | 10-25 | 15-25           | NP-5                     |
| 172*, 173*:<br>Beoska-----    | 0-13  | Silt loam-----                                                                  | ML             | A-4      | 0                               | 85-95                                | 75-85  | 70-80  | 55-70 | 30-35           | NP-5                     |
|                               | 13-24 | Silt loam, silty clay loam.                                                     | CL             | A-6, A-7 | 0                               | 80-100                               | 75-100 | 70-85  | 60-85 | 35-45           | 15-25                    |
|                               | 24-55 | Stratified gravelly very fine sandy loam to gravelly sandy loam.                | GM, SM         | A-1, A-2 | 0-10                            | 55-80                                | 50-75  | 30-50  | 20-35 | 15-25           | NP-5                     |
|                               | 55-60 | Stratified very gravelly sandy loam to extremely gravelly very fine sandy loam. | GM             | A-1      | 0-15                            | 30-55                                | 25-50  | 15-35  | 10-25 | 15-25           | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol   | Depth | USDA texture                                                                                   | Classification          |          | Frag-ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|----------------------------|-------|------------------------------------------------------------------------------------------------|-------------------------|----------|-----------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                            |       |                                                                                                | Unified                 | AASHTO   |                             | 4                                    | 10     | 40    | 200   |                 |                          |
|                            | In    |                                                                                                |                         |          | Pct                         |                                      |        |       |       | Pct             |                          |
| 172*, 173*:<br>Tenabo----- | 0-13  | Silt loam-----                                                                                 | ML                      | A-4      | 0                           | 95-100                               | 90-100 | 85-95 | 75-85 | 25-35           | NP-10                    |
|                            | 13-20 | Clay loam, silty<br>clay loam,<br>gravelly clay<br>loam.                                       | CL                      | A-6      | 0                           | 95-100                               | 70-95  | 60-90 | 50-85 | 30-40           | 15-25                    |
|                            | 20-39 | Indurated-----                                                                                 | ---                     | ---      | ---                         | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                            | 39-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly coarse<br>sand.          | GP-GM, GM               | A-1      | 5-25                        | 40-60                                | 35-55  | 25-35 | 5-20  | ---             | NP                       |
| 174*:<br>Beoska-----       | 0-13  | Silt loam-----                                                                                 | ML                      | A-4      | 0                           | 85-95                                | 75-85  | 70-80 | 55-70 | 30-35           | NP-5                     |
|                            | 13-24 | Silt loam, silty<br>clay loam.                                                                 | CL                      | A-6, A-7 | 0                           | 80-100                               | 75-100 | 70-85 | 60-85 | 35-45           | 15-25                    |
|                            | 24-55 | Stratified<br>gravelly very<br>fine sandy loam<br>to gravelly<br>sandy loam.                   | GM, SM                  | A-1, A-2 | 0-10                        | 55-80                                | 50-75  | 30-50 | 20-35 | 15-25           | NP-5                     |
|                            | 55-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly very<br>fine sandy loam. | GM                      | A-1      | 0-15                        | 30-55                                | 25-50  | 15-35 | 10-25 | 15-25           | NP-5                     |
| Chiara-----                | 0-5   | Fine sandy loam                                                                                | SM                      | A-4      | 0                           | 95-100                               | 90-100 | 65-75 | 40-50 | ---             | NP                       |
|                            | 5-16  | Very fine sandy<br>loam, loam, silt<br>loam.                                                   | ML                      | A-4      | 0                           | 95-100                               | 90-100 | 80-95 | 70-80 | 25-35           | NP-5                     |
|                            | 16-20 | Indurated-----                                                                                 | ---                     | ---      | ---                         | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 175*:<br>Beoska-----       | 0-13  | Silt loam-----                                                                                 | ML                      | A-4      | 0                           | 85-95                                | 75-85  | 70-80 | 55-70 | 30-35           | NP-5                     |
|                            | 13-24 | Silt loam, silty<br>clay loam.                                                                 | CL                      | A-6, A-7 | 0                           | 80-100                               | 75-100 | 70-85 | 60-85 | 35-45           | 15-25                    |
|                            | 24-55 | Stratified<br>gravelly very<br>fine sandy loam<br>to gravelly<br>sandy loam.                   | GM, SM                  | A-1, A-2 | 0-10                        | 55-80                                | 50-75  | 30-50 | 20-35 | 15-25           | NP-5                     |
|                            | 55-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly very<br>fine sandy loam. | GM                      | A-1      | 0-15                        | 30-55                                | 25-50  | 15-35 | 10-25 | 15-25           | NP-5                     |
| Jenor-----                 | 0-6   | Very fine sandy<br>loam.                                                                       | ML, CL-ML               | A-4      | 0                           | 90-100                               | 90-100 | 80-95 | 50-65 | 15-25           | NP-10                    |
|                            | 6-16  | Fine sandy loam,<br>loam.                                                                      | SM, SM-SC               | A-4      | 0-5                         | 80-95                                | 75-95  | 60-75 | 35-50 | 15-25           | NP-10                    |
|                            | 16-26 | Fine sandy loam,<br>sandy loam,<br>gravelly loam.                                              | SM, SM-SC,<br>ML, CL-ML | A-4, A-2 | 0-5                         | 75-95                                | 60-90  | 50-75 | 30-60 | 15-25           | NP-10                    |
|                            | 26-60 | Indurated-----                                                                                 | ---                     | ---      | ---                         | ---                                  | ---    | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                   | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                                | Unified        | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                        |                          |
|                             | In    |                                                                                                |                |          | Pct                             |                                      |        |       |       |                        |                          |
| 177*:<br>Beoska-----        | 0-13  | Gravelly very<br>fine sandy loam.                                                              | SM             | A-4      | 0-10                            | 70-80                                | 55-75  | 50-70 | 35-50 | 15-25                  | NP-5                     |
|                             | 13-24 | Silt loam, silty<br>clay loam.                                                                 | CL             | A-6, A-7 | 0                               | 80-100                               | 75-100 | 70-85 | 60-85 | 35-45                  | 15-25                    |
|                             | 24-55 | Stratified<br>gravelly very<br>fine sandy loam<br>to gravelly<br>sandy loam.                   | GM, SM         | A-1, A-2 | 0-10                            | 60-80                                | 55-70  | 30-50 | 20-35 | ---                    | NP                       |
|                             | 55-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly very<br>fine sandy loam. | GM             | A-1      | 0-15                            | 30-55                                | 25-50  | 15-35 | 10-25 | ---                    | NP                       |
| Oxcorel-----                | 0-5   | Gravelly very<br>fine sandy loam.                                                              | SM, GM         | A-4      | 0-10                            | 60-85                                | 55-75  | 45-70 | 35-50 | 15-25                  | NP-5                     |
|                             | 5-20  | Clay, clay loam                                                                                | CL, CH         | A-7      | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                             | 20-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                            | GM             | A-1      | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25                  | NP-5                     |
| McConnel-----               | 0-2   | Gravelly fine<br>sandy loam.                                                                   | GM             | A-2, A-4 | 0                               | 60-70                                | 50-70  | 40-60 | 25-45 | 15-25                  | NP-5                     |
|                             | 2-12  | Loam, sandy loam,<br>fine sandy loam.                                                          | ML, SM         | A-4      | 0                               | 95-100                               | 90-100 | 65-80 | 45-60 | 15-25                  | NP-5                     |
|                             | 12-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly coarse<br>sand.          | GP             | A-1      | 0-15                            | 25-35                                | 10-35  | 5-15  | 0-5   | ---                    | NP                       |
| 178*:<br>Beoska-----        | 0-13  | Very fine sandy<br>loam.                                                                       | ML             | A-4      | 10-25                           | 85-95                                | 80-90  | 65-80 | 50-65 | 15-25                  | NP-5                     |
|                             | 13-24 | Silt loam, silty<br>clay loam.                                                                 | CL             | A-6, A-7 | 0                               | 80-100                               | 75-100 | 70-85 | 60-85 | 35-45                  | 15-25                    |
|                             | 24-55 | Stratified<br>gravelly very<br>fine sandy loam<br>to gravelly<br>sandy loam.                   | SM, GM         | A-1, A-2 | 0-10                            | 60-80                                | 55-70  | 30-50 | 20-35 | ---                    | NP                       |
|                             | 55-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly very<br>fine sandy loam. | GM             | A-1      | 0-15                            | 30-55                                | 25-50  | 15-35 | 10-25 | ---                    | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                    | Classification |          | Frag-ments<br>> 3 inches | Percentage passing sieve number-- |        |       |       | Liquid limit | Plas-ticity index |
|--------------------------|-------|---------------------------------------------------------------------------------|----------------|----------|--------------------------|-----------------------------------|--------|-------|-------|--------------|-------------------|
|                          |       |                                                                                 | Unified        | AASHTO   |                          | 4                                 | 10     | 40    | 200   |              |                   |
|                          | In    |                                                                                 |                |          | Pct                      |                                   |        |       |       | Pct          |                   |
| 178*:<br>Malpais-----    | 0-3   | Very gravelly loam.                                                             | GM             | A-2      | 40-50                    | 45-55                             | 35-50  | 35-45 | 25-35 | 20-30        | NP-5              |
|                          | 3-15  | Very gravelly loam, very cobbly fine sandy loam, very stony sandy loam.         | GM             | A-1      | 40-50                    | 30-40                             | 25-35  | 20-30 | 10-20 | 20-30        | NP-5              |
|                          | 15-60 | Very stony loam, very cobbly fine sandy loam, extremely cobbly sandy loam.      | GM             | A-1, A-2 | 40-50                    | 45-55                             | 35-50  | 25-45 | 20-30 | 20-30        | NP-5              |
| Old Camp-----            | 0-2   | Very cobbly very fine sandy loam.                                               | GM, SM         | A-2, A-4 | 25-55                    | 60-70                             | 55-65  | 50-60 | 30-40 | 15-25        | NP-5              |
|                          | 2-14  | Very cobbly clay loam, extremely stony sandy clay loam, very stony clay loam.   | GC             | A-2, A-6 | 35-50                    | 40-55                             | 35-50  | 30-45 | 25-40 | 30-40        | 15-25             |
|                          | 14    | Unweathered bedrock.                                                            | ---            | ---      | ---                      | ---                               | ---    | ---   | ---   | ---          | ---               |
| 181*:<br>Beoska-----     | 0-13  | Gravelly sandy loam.                                                            | SM             | A-1, A-2 | 0-10                     | 70-80                             | 55-75  | 35-60 | 20-35 | 15-25        | NP-5              |
|                          | 13-24 | Silt loam, silty clay loam.                                                     | CL             | A-6, A-7 | 0                        | 80-100                            | 75-100 | 70-85 | 60-85 | 35-45        | 15-25             |
|                          | 24-55 | Stratified gravelly very fine sandy loam to gravelly sandy loam.                | GM, SM         | A-1, A-2 | 0-10                     | 60-80                             | 55-70  | 30-50 | 20-35 | ---          | NP                |
|                          | 55-60 | Stratified very gravelly sandy loam to extremely gravelly very fine sandy loam. | GM             | A-1      | 0-15                     | 30-55                             | 25-50  | 15-35 | 10-25 | ---          | NP                |
| Orovada-----             | 0-8   | Fine sandy loam                                                                 | SM             | A-2, A-4 | 0                        | 95-100                            | 90-100 | 75-95 | 30-50 | ---          | NP                |
|                          | 8-20  | Fine sandy loam, loam.                                                          | SM, ML         | A-4      | 0                        | 75-100                            | 75-95  | 60-80 | 40-60 | 20-30        | NP-5              |
|                          | 20-60 | Stratified fine sandy loam to silt loam.                                        | SM, ML         | A-4      | 0                        | 75-100                            | 75-95  | 60-85 | 35-55 | 20-30        | NP-5              |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth<br><br>In | USDA texture                                                                    | Classification       |          | Frag-<br>ments<br>> 3<br>inches<br><br>Pct | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit<br><br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-----------------|---------------------------------------------------------------------------------|----------------------|----------|--------------------------------------------|--------------------------------------|--------|-------|-------|----------------------------|--------------------------|
|                             |                 |                                                                                 | Unified              | AASHTO   |                                            | 4                                    | 10     | 40    | 200   |                            |                          |
| 182*:<br>Beoska-----        | 0-13            | Very fine sandy loam.                                                           | ML, SM               | A-4      | 0                                          | 85-95                                | 75-95  | 70-80 | 45-65 | 15-25                      | NP-5                     |
|                             | 13-24           | Silt loam, silty clay loam.                                                     | CL                   | A-6, A-7 | 0                                          | 80-100                               | 75-100 | 70-85 | 60-85 | 35-45                      | 15-25                    |
|                             | 24-55           | Stratified gravelly very fine sandy loam to gravelly sandy loam.                | GM, SM               | A-1, A-2 | 0-10                                       | 55-80                                | 50-75  | 30-50 | 20-35 | 15-25                      | NP-5                     |
|                             | 55-60           | Stratified very gravelly sandy loam to extremely gravelly very fine sandy loam. | GM                   | A-1      | 0-15                                       | 30-55                                | 25-50  | 15-35 | 10-25 | 15-25                      | NP-5                     |
| Whirlo-----                 | 0-12            | Silt loam-----                                                                  | ML                   | A-4      | 0                                          | 80-95                                | 75-90  | 70-85 | 55-70 | 20-25                      | NP-5                     |
|                             | 12-24           | Very gravelly fine sandy loam, very gravelly loam.                              | GM                   | A-1, A-2 | 0-5                                        | 45-55                                | 35-50  | 30-40 | 15-35 | ---                        | NP                       |
|                             | 24-60           | Stratified very gravelly loam to extremely gravelly coarse sandy loam.          | GW-GM, GP-GM         | A-1      | 0-5                                        | 40-50                                | 20-35  | 10-25 | 5-10  | ---                        | NP                       |
| Misad-----                  | 0-7             | Gravelly sandy loam.                                                            | SM, SM-SC            | A-1, A-2 | 0-5                                        | 65-80                                | 55-70  | 45-60 | 20-35 | 15-25                      | NP-10                    |
|                             | 7-31            | Stratified fine sandy loam to very gravelly sandy loam.                         | GM, GM-GC, SM, SM-SC | A-1, A-2 | 5-10                                       | 45-65                                | 40-60  | 25-40 | 10-25 | 15-25                      | NP-10                    |
|                             | 31-60           | Stratified very gravelly loamy sand to extremely gravelly coarse sand.          | GP-GM                | A-1      | 5-10                                       | 40-55                                | 20-40  | 10-30 | 5-10  | ---                        | NP                       |
| 183*:<br>Beoska-----        | 0-13            | Very fine sandy loam.                                                           | ML, SM               | A-4      | 0                                          | 85-95                                | 75-95  | 70-80 | 45-65 | 15-25                      | NP-5                     |
|                             | 13-24           | Silt loam, silty clay loam.                                                     | CL                   | A-6, A-7 | 0                                          | 80-100                               | 75-100 | 70-85 | 60-85 | 35-45                      | 15-25                    |
|                             | 24-55           | Stratified gravelly very fine sandy loam to gravelly sandy loam.                | GM, SM               | A-1, A-2 | 0-10                                       | 55-80                                | 50-75  | 30-50 | 20-35 | 15-25                      | NP-5                     |
|                             | 55-60           | Stratified very gravelly sandy loam to extremely gravelly very fine sandy loam. | GM                   | A-1      | 0-15                                       | 30-55                                | 25-50  | 15-35 | 10-25 | 15-25                      | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                       | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|------------------------|--------------------------|
|                          |       |                                                                                    | Unified        | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                        |                          |
|                          | In    |                                                                                    |                |          | Pct                             |                                      |        |       |       |                        |                          |
| 183*:<br>Dewar-----      | 0-4   | Gravelly loam----                                                                  | GC, CL, SC     | A-6      | 0-5                             | 60-90                                | 55-80  | 45-80 | 35-70 | 25-35                  | 10-15                    |
|                          | 4-14  | Gravelly silty<br>clay loam,<br>gravelly clay<br>loam.                             | GC, CL         | A-6, A-7 | 0-10                            | 65-90                                | 60-80  | 55-80 | 45-75 | 35-45                  | 15-20                    |
|                          | 14-50 | Indurated-----                                                                     | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Orovada-----             | 0-8   | Gravelly very<br>fine sandy loam.                                                  | GM, SM         | A-2, A-4 | 0                               | 60-80                                | 55-75  | 45-70 | 30-50 | 15-25                  | NP-5                     |
|                          | 8-20  | Fine sandy loam,<br>loam, very fine<br>sandy loam.                                 | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-85 | 40-70 | 20-30                  | NP-5                     |
|                          | 20-60 | Stratified fine<br>sandy loam to<br>silt loam.                                     | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-85 | 35-55 | 20-30                  | NP-5                     |
| 185-----<br>Beowawe      | 0-6   | Silt loam-----                                                                     | ML             | A-4      | 0                               | 100                                  | 95-100 | 85-95 | 65-85 | 20-30                  | NP-5                     |
|                          | 6-11  | Loam, silt loam                                                                    | CL-ML, ML      | A-4      | 0                               | 100                                  | 95-100 | 85-95 | 70-85 | 25-35                  | 5-10                     |
|                          | 11-60 | Coarse sandy<br>loam, loam.                                                        | SM, ML         | A-2, A-4 | 0                               | 100                                  | 85-95  | 55-80 | 30-60 | 15-25                  | NP-5                     |
| 192*:<br>Vanwyper-----   | 0-7   | Cobbly loam-----                                                                   | CL             | A-6      | 15-25                           | 85-90                                | 80-90  | 60-85 | 55-75 | 25-35                  | 10-15                    |
|                          | 7-22  | Very cobbly clay<br>loam, very<br>cobbly clay.                                     | GC, CL, CH     | A-7      | 35-55                           | 55-75                                | 50-65  | 45-60 | 40-55 | 40-60                  | 20-40                    |
|                          | 22-26 | Unweathered<br>bedrock.                                                            | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Trunk-----               | 0-5   | Cobbly clay loam                                                                   | CL             | A-6, A-7 | 15-30                           | 75-95                                | 70-90  | 65-85 | 55-70 | 35-45                  | 15-20                    |
|                          | 5-28  | Gravelly clay,<br>gravelly clay<br>loam.                                           | CL, CH, GC     | A-7      | 0-10                            | 55-85                                | 50-80  | 45-75 | 40-65 | 40-55                  | 20-30                    |
|                          | 28-32 | Unweathered<br>bedrock.                                                            | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Trunk, steep----         | 0-5   | Cobbly clay loam                                                                   | CL             | A-6, A-7 | 15-30                           | 75-95                                | 70-90  | 65-85 | 55-70 | 35-45                  | 15-20                    |
|                          | 5-28  | Gravelly clay,<br>gravelly clay<br>loam.                                           | CL, CH, GC     | A-7      | 0-10                            | 55-85                                | 50-80  | 45-75 | 40-65 | 40-55                  | 20-30                    |
|                          | 28-32 | Unweathered<br>bedrock.                                                            | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| 193*:<br>Berning-----    | 0-9   | Extremely cobbly<br>loam.                                                          | GM-GC, GC      | A-2      | 60-70                           | 45-60                                | 30-50  | 25-40 | 15-30 | 25-35                  | 5-15                     |
|                          | 9-40  | Very gravelly<br>clay loam, very<br>gravelly clay,<br>very gravelly<br>sandy clay. | GC             | A-2      | 0-30                            | 30-45                                | 25-40  | 25-35 | 15-30 | 40-50                  | 15-25                    |
|                          | 40-60 | Very gravelly<br>sandy loam,<br>extremely<br>gravelly sandy<br>clay loam.          | GM-GC, GC      | A-2      | 20-40                           | 30-50                                | 20-40  | 15-30 | 10-20 | 25-35                  | 5-15                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth<br>In | USDA texture                                           | Classification          |                  | Frag-<br>ments<br>> 3<br>inches<br>Pct | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------------|--------------------------------------------------------|-------------------------|------------------|----------------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                             |             |                                                        | Unified                 | AASHTO           |                                        | 4                                    | 10     | 40     | 200   |                        |                          |
| 193*:<br>Alley-----         | 0-7         | Very gravelly<br>loam.                                 | GM, GM-GC               | A-1, A-2,<br>A-4 | 0-5                                    | 30-55                                | 25-50  | 20-45  | 15-40 | 20-30                  | NP-10                    |
|                             | 7-26        | Gravelly clay<br>loam, gravelly<br>loam.               | SC, GC                  | A-6              | 0-10                                   | 65-80                                | 55-75  | 50-65  | 35-50 | 30-40                  | 10-15                    |
|                             | 26-37       | Gravelly loam,<br>gravelly sandy<br>loam.              | GM, GM-GC,<br>SM, SM-SC | A-2              | 0-10                                   | 60-70                                | 50-60  | 35-45  | 25-35 | 20-30                  | NP-10                    |
|                             | 37-60       | Very gravelly<br>sandy loam.                           | GM                      | A-1              | 0-10                                   | 30-55                                | 25-50  | 15-40  | 10-25 | ---                    | NP                       |
| 200-----<br>Sonoma Variant  | 0-4         | Silt loam-----                                         | ML                      | A-4              | 0                                      | 100                                  | 100    | 95-100 | 75-85 | 25-30                  | NP-5                     |
|                             | 4-60        | Silt loam-----                                         | ML                      | A-4              | 0                                      | 100                                  | 100    | 95-100 | 75-85 | 25-30                  | NP-5                     |
| 202*:<br>Bioya-----         | 0-11        | Very fine sandy<br>loam.                               | ML, CL-ML               | A-4              | 0                                      | 100                                  | 95-100 | 80-100 | 50-80 | 20-30                  | NP-10                    |
|                             | 11-38       | Silt loam, loam                                        | CL, CL-ML               | A-6, A-4         | 0                                      | 100                                  | 95-100 | 85-100 | 50-80 | 25-35                  | 5-15                     |
|                             | 38-60       | Indurated-----                                         | ---                     | ---              | ---                                    | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 60-65       | Fine sandy loam                                        | SM                      | A-4              | 0                                      | 95-100                               | 90-100 | 75-85  | 35-50 | 20-25                  | NP-5                     |
| Chiara-----                 | 0-5         | Very fine sandy<br>loam.                               | ML                      | A-4              | 0                                      | 95-100                               | 90-100 | 85-95  | 70-80 | 25-35                  | NP-5                     |
|                             | 5-16        | Very fine sandy<br>loam, loam, silt<br>loam.           | ML                      | A-4              | 0                                      | 95-100                               | 90-100 | 80-95  | 70-80 | 25-35                  | NP-5                     |
|                             | 16-20       | Indurated-----                                         | ---                     | ---              | ---                                    | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Cortez-----                 | 0-12        | Very fine sandy<br>loam.                               | ML                      | A-4              | 0                                      | 95-100                               | 85-95  | 80-90  | 50-70 | ---                    | NP                       |
|                             | 12-26       | Clay, gravelly<br>clay, silty<br>clay.                 | CH                      | A-7              | 0                                      | 80-95                                | 60-85  | 55-80  | 55-75 | 50-60                  | 35-45                    |
|                             | 26-60       | Indurated-----                                         | ---                     | ---              | ---                                    | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| 203*:<br>Bioya-----         | 0-8         | Very fine sandy<br>loam.                               | ML, CL-ML               | A-4              | 0                                      | 100                                  | 95-100 | 80-100 | 50-80 | 20-30                  | NP-10                    |
|                             | 8-35        | Silt loam, loam                                        | CL, CL-ML               | A-6, A-4         | 0                                      | 100                                  | 95-100 | 85-100 | 50-80 | 25-35                  | 5-15                     |
|                             | 35-39       | Indurated-----                                         | ---                     | ---              | ---                                    | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Shabliss-----               | 0-6         | Very fine sandy<br>loam.                               | ML                      | A-4              | 0-5                                    | 95-100                               | 95-100 | 85-95  | 60-75 | ---                    | NP                       |
|                             | 6-16        | Very fine sandy<br>loam, loam, silt<br>loam.           | ML                      | A-4              | 0-5                                    | 95-100                               | 95-100 | 80-95  | 60-75 | ---                    | NP                       |
|                             | 16-34       | Cemented-----                                          | ---                     | ---              | ---                                    | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 34-60       | Loamy sand,<br>gravelly loamy<br>sand.                 | SM                      | A-1              | 0-5                                    | 70-85                                | 60-80  | 35-50  | 10-25 | ---                    | NP                       |
| Puett-----                  | 0-4         | Gravelly sandy<br>loam.                                | GM, SM                  | A-2              | 5-10                                   | 55-80                                | 50-75  | 40-60  | 25-35 | 15-20                  | NP-5                     |
|                             | 4-15        | Coarse sandy<br>loam, gravelly<br>sandy loam,<br>loam. | SM, ML, GM              | A-1, A-2,<br>A-4 | 0                                      | 55-95                                | 50-90  | 30-80  | 15-55 | ---                    | NP                       |
|                             | 15          | Weathered bedrock                                      | ---                     | ---              | ---                                    | ---                                  | ---    | ---    | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                           | Classification       |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------|----------------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                             |       |                                                                        | Unified              | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                             | In    |                                                                        |                      |          | Pct                             |                                      |        |        |       |                        |                          |
| 211-----<br>Blacka          | 0-8   | Very fine sandy loam.                                                  | ML                   | A-4      | 0                               | 100                                  | 100    | 85-95  | 50-65 | ---                    | NP                       |
|                             | 8-21  | Fine sandy loam, very fine sandy loam.                                 | SM, ML               | A-4      | 0                               | 100                                  | 100    | 70-90  | 40-60 | 25-30                  | NP-5                     |
|                             | 21-31 | Cemented-----                                                          | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 31-60 | Stratified sandy loam to loam.                                         | SM                   | A-4      | 0                               | 100                                  | 100    | 65-85  | 35-50 | 20-25                  | NP-5                     |
| 212*:<br>Blacka-----        | 0-8   | Very fine sandy loam.                                                  | ML                   | A-4      | 0                               | 100                                  | 100    | 85-95  | 50-65 | ---                    | NP                       |
|                             | 8-21  | Fine sandy loam, very fine sandy loam.                                 | SM, ML               | A-4      | 0                               | 100                                  | 100    | 70-90  | 40-60 | 25-30                  | NP-5                     |
|                             | 21-31 | Cemented-----                                                          | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 31-60 | Stratified sandy loam to loam.                                         | SM                   | A-4      | 0                               | 100                                  | 100    | 65-85  | 35-50 | 20-25                  | NP-5                     |
| Broyles-----                | 0-11  | Very fine sandy loam.                                                  | ML                   | A-4      | 0                               | 100                                  | 95-100 | 85-95  | 60-75 | ---                    | NP                       |
|                             | 11-60 | Stratified loam to gravelly loamy sand.                                | SM                   | A-2      | 0                               | 70-100                               | 60-95  | 30-40  | 25-35 | ---                    | NP                       |
| 213*:<br>Blacka-----        | 0-8   | Very fine sandy loam.                                                  | ML                   | A-4      | 0                               | 100                                  | 100    | 85-95  | 50-65 | 25-30                  | NP-5                     |
|                             | 8-21  | Fine sandy loam, very fine sandy loam.                                 | SM, ML               | A-4      | 0                               | 100                                  | 100    | 70-90  | 40-60 | 25-30                  | NP-5                     |
|                             | 21-31 | Cemented-----                                                          | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 31-60 | Stratified sandy loam to loam.                                         | SM                   | A-4      | 0                               | 100                                  | 100    | 65-85  | 35-50 | 20-25                  | NP-5                     |
| Broyles-----                | 0-5   | Very fine sandy loam.                                                  | ML                   | A-4      | 0                               | 95-100                               | 95-100 | 85-100 | 50-70 | 20-25                  | NP-5                     |
|                             | 5-11  | Silt loam, very fine sandy loam, fine sandy loam.                      | ML, SM               | A-4      | 0                               | 95-100                               | 90-100 | 75-90  | 40-55 | 20-25                  | NP-5                     |
|                             | 11-60 | Stratified loam to gravelly loamy sand.                                | SM                   | A-2      | 0                               | 70-100                               | 60-95  | 30-40  | 25-35 | ---                    | NP                       |
| 220-----<br>Blackhawk       | 0-8   | Very fine sandy loam.                                                  | ML                   | A-4      | 0                               | 95-100                               | 95-100 | 85-95  | 65-75 | ---                    | NP                       |
|                             | 8-14  | Silt loam, loam, very fine sandy loam.                                 | ML                   | A-4      | 0                               | 95-100                               | 95-100 | 85-95  | 70-80 | 30-35                  | NP-5                     |
|                             | 14-17 | Cemented-----                                                          | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 17-38 | Stratified loam to gravelly loamy coarse sand.                         | SM                   | A-1, A-2 | 0                               | 75-90                                | 70-85  | 35-50  | 10-30 | ---                    | NP                       |
|                             | 38-60 | Stratified very gravelly sandy loam to extremely gravelly coarse sand. | GP-GM, SP, GP, SP-SM | A-1      | 0                               | 45-60                                | 20-50  | 10-35  | 0-10  | ---                    | NP                       |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                    | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                             |       |                                                                                 | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                             | In    |                                                                                 |                |          | Pct                             |                                      |        |        |       | Pct             |                          |
| 230, 231-----<br>Broyles    | 0-11  | Very fine sandy loam.                                                           | ML             | A-4      | 0                               | 100                                  | 95-100 | 85-95  | 60-75 | ---             | NP                       |
|                             | 11-60 | Stratified loam to gravelly loamy sand.                                         | SM             | A-2      | 0                               | 70-100                               | 60-95  | 30-40  | 25-35 | ---             | NP                       |
| 232-----<br>Broyles         | 0-11  | Very fine sandy loam.                                                           | ML             | A-4      | 0                               | 100                                  | 100    | 85-95  | 55-65 | 20-30           | NP-5                     |
|                             | 11-28 | Sandy loam-----                                                                 | SM             | A-2, A-4 | 0                               | 100                                  | 100    | 60-70  | 30-40 | 15-20           | NP-5                     |
|                             | 28-45 | Stratified loamy sand to loamy fine sand.                                       | SM             | A-2      | 0                               | 100                                  | 100    | 55-75  | 20-35 | ---             | NP                       |
|                             | 45-60 | Cemented-----                                                                   | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| 233-----<br>Broyles         | 0-5   | Very fine sandy loam.                                                           | ML             | A-4      | 0                               | 95-100                               | 95-100 | 85-100 | 50-70 | 20-25           | NP-5                     |
|                             | 5-11  | Silt loam, very fine sandy loam, fine sandy loam.                               | ML, SM         | A-4      | 0                               | 95-100                               | 90-100 | 75-90  | 40-55 | 20-25           | NP-5                     |
|                             | 11-60 | Stratified loam to gravelly loamy sand.                                         | SM             | A-2      | 0                               | 70-100                               | 60-95  | 30-40  | 25-35 | ---             | NP                       |
| 235*:<br>Broyles-----       | 0-11  | Silt loam-----                                                                  | ML             | A-4      | 0                               | 100                                  | 95-100 | 85-95  | 60-75 | ---             | NP                       |
|                             | 11-60 | Stratified loam to gravelly loamy sand.                                         | SM             | A-2      | 0                               | 70-100                               | 60-95  | 30-40  | 25-35 | ---             | NP                       |
| Creemon-----                | 0-7   | Silt loam-----                                                                  | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | ---             | NP                       |
|                             | 7-18  | Very fine sandy loam, silt loam.                                                | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                             | 18-60 | Stratified very fine sandy loam to silt loam.                                   | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
| 237*:<br>Broyles-----       | 0-11  | Very fine sandy loam.                                                           | ML             | A-4      | 0                               | 100                                  | 95-100 | 85-95  | 60-75 | ---             | NP                       |
|                             | 11-60 | Stratified loam to gravelly loamy sand.                                         | SM             | A-2      | 0                               | 70-100                               | 60-95  | 30-40  | 25-35 | ---             | NP                       |
| Beoska-----                 | 0-13  | Very fine sandy loam.                                                           | ML, SM         | A-4      | 0                               | 85-95                                | 75-95  | 70-80  | 45-65 | 15-25           | NP-5                     |
|                             | 13-24 | Silt loam, silty clay loam.                                                     | CL             | A-6, A-7 | 0                               | 80-100                               | 75-100 | 70-85  | 60-85 | 35-45           | 15-25                    |
|                             | 24-55 | Stratified gravelly very fine sandy loam to gravelly sandy loam.                | GM, SM         | A-1, A-2 | 0-10                            | 55-80                                | 50-75  | 30-50  | 20-35 | 15-25           | NP-5                     |
|                             | 55-60 | Stratified very gravelly sandy loam to extremely gravelly very fine sandy loam. | GM             | A-1      | 0-15                            | 30-55                                | 25-50  | 15-35  | 10-25 | 15-25           | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                       | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
|                             |       |                                                                                    | Unified         | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                 |                          |
|                             | In    |                                                                                    |                 |          | Pct                             |                                      |        |        |        | Pct             |                          |
| 237*:<br>Orovada-----       | 0-8   | Fine sandy loam                                                                    | SM              | A-2, A-4 | 0                               | 95-100                               | 90-100 | 75-95  | 30-50  | ---             | NP                       |
|                             | 8-20  | Fine sandy loam,<br>loam.                                                          | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-80  | 40-60  | 20-30           | NP-5                     |
|                             | 20-60 | Stratified fine<br>sandy loam to<br>silt loam.                                     | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-85  | 35-55  | 20-30           | NP-5                     |
| 240-----<br>Bubus           | 0-6   | Very fine sandy<br>loam.                                                           | ML              | A-4      | 0                               | 85-95                                | 75-90  | 70-80  | 50-60  | 25-30           | NP-5                     |
|                             | 6-60  | Stratified sandy<br>loam to silt<br>loam.                                          | ML              | A-4      | 0                               | 95-100                               | 90-100 | 80-90  | 50-60  | 25-30           | NP-5                     |
| 242-----<br>Bubus           | 0-6   | Very fine sandy<br>loam.                                                           | ML              | A-4      | 0                               | 95-100                               | 90-100 | 80-90  | 50-60  | 25-30           | NP-5                     |
|                             | 6-40  | Very fine sandy<br>loam.                                                           | SM, ML          | A-4      | 0                               | 95-100                               | 90-100 | 80-90  | 45-60  | 25-30           | NP-5                     |
|                             | 40-60 | Stratified very<br>gravelly sand to<br>extremely<br>gravelly loamy<br>coarse sand. | GP-GM,<br>SP-SM | A-1      | 0                               | 45-60                                | 20-40  | 10-20  | 5-10   | ---             | NP                       |
| 243*:<br>Bubus-----         | 0-6   | Very fine sandy<br>loam.                                                           | ML              | A-4      | 0                               | 85-95                                | 75-90  | 70-80  | 50-60  | 25-30           | NP-5                     |
|                             | 6-60  | Stratified sandy<br>loam to silt<br>loam.                                          | ML              | A-4      | 0                               | 95-100                               | 90-100 | 80-90  | 50-60  | 25-30           | NP-5                     |
| Playas.                     |       |                                                                                    |                 |          |                                 |                                      |        |        |        |                 |                          |
| 244*:<br>Bubus-----         | 0-6   | Gravelly loam----                                                                  | SM              | A-4      | 0                               | 75-85                                | 65-75  | 55-65  | 40-50  | 25-30           | NP-5                     |
|                             | 6-60  | Stratified sandy<br>loam to silt<br>loam.                                          | ML              | A-4      | 0                               | 95-100                               | 90-100 | 80-90  | 50-60  | 25-30           | NP-5                     |
| Relley-----                 | 0-8   | Silt loam-----                                                                     | CL-ML, ML       | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 75-90  | 25-35           | 5-10                     |
|                             | 8-16  | Silt loam-----                                                                     | CL-ML, ML       | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 16-28 | Silt loam-----                                                                     | CL-ML, ML       | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 28-60 | Silt loam-----                                                                     | CL-ML, ML       | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
| 245*:<br>Bubus-----         | 0-6   | Very fine sandy<br>loam.                                                           | ML              | A-4      | 0                               | 85-95                                | 75-90  | 70-80  | 50-60  | 25-30           | NP-5                     |
|                             | 6-60  | Stratified sandy<br>loam to silt<br>loam.                                          | ML              | A-4      | 0                               | 95-100                               | 90-100 | 80-90  | 50-60  | 25-30           | NP-5                     |
| Needle Peak----             | 0-9   | Silt loam-----                                                                     | CL, ML          | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-90  | 30-45           | 10-15                    |
|                             | 9-49  | Silt loam, silty<br>clay loam.                                                     | CL, ML          | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-95  | 30-50           | 10-20                    |
|                             | 49-60 | Sandy loam-----                                                                    | SM              | A-4      | 0                               | 100                                  | 100    | 60-80  | 35-50  | 15-25           | NP-5                     |
| Yipor-----                  | 0-16  | Very fine sandy<br>loam.                                                           | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 60-80  | 15-25           | NP-5                     |
|                             | 16-60 | Silt loam, very<br>fine sandy loam.                                                | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-100 | 20-30           | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                    | Classification |        | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------|----------------|--------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                          |       |                                                 | Unified        | AASHTO |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                          | In    |                                                 |                |        | Pct                             |                                      |        |        |       | Pct             |                          |
| 247*:<br>Bubus-----      | 0-6   | Very fine sandy loam.                           | ML             | A-4    | 0                               | 85-95                                | 75-90  | 70-80  | 50-60 | 25-30           | NP-5                     |
|                          | 6-60  | Stratified sandy loam to silt loam.             | ML             | A-4    | 0                               | 95-100                               | 90-100 | 80-90  | 50-60 | 25-30           | NP-5                     |
| Isolde-----              | 0-7   | Fine sand-----                                  | SP, SP-SM      | A-3    | 0                               | 100                                  | 100    | 75-90  | 0-10  | ---             | NP                       |
|                          | 7-60  | Fine sand, sand                                 | SP, SP-SM      | A-3    | 0                               | 100                                  | 100    | 50-80  | 0-10  | ---             | NP                       |
| 248*:<br>Bubus-----      | 0-6   | Very fine sandy loam.                           | ML             | A-4    | 0                               | 85-95                                | 75-90  | 70-80  | 50-60 | 25-30           | NP-5                     |
|                          | 6-60  | Stratified sandy loam to silt loam.             | ML             | A-4    | 0                               | 95-100                               | 90-100 | 80-90  | 50-60 | 25-30           | NP-5                     |
| Batan-----               | 0-5   | Silt loam-----                                  | ML             | A-4    | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-35           | 5-10                     |
|                          | 5-68  | Stratified silt loam to silty clay loam.        | CL             | A-6    | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-40           | 15-25                    |
| Reese-----               | 0-9   | Silt loam-----                                  | CL-ML          | A-4    | 0                               | 100                                  | 100    | 95-100 | 80-85 | 25-30           | 5-10                     |
|                          | 9-60  | Stratified silt loam to silty clay loam.        | CL             | A-6    | 0                               | 100                                  | 90-100 | 75-90  | 70-85 | 25-35           | 10-15                    |
| 251*:<br>Bucan-----      | 0-5   | Cobbly loam-----                                | CL             | A-6    | 20-25                           | 75-85                                | 70-80  | 65-75  | 50-60 | 30-35           | 10-15                    |
|                          | 5-23  | Clay-----                                       | CH             | A-7    | 0-10                            | 85-95                                | 80-90  | 75-85  | 65-75 | 50-60           | 35-45                    |
|                          | 23-42 | Cobbly clay, gravelly clay loam, gravelly clay. | CL             | A-7    | 10-30                           | 75-90                                | 70-85  | 60-70  | 50-60 | 40-50           | 25-35                    |
|                          | 42-46 | Unweathered bedrock.                            | ---            | ---    | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Bucan, steep----         | 0-5   | Very cobbly loam                                | GC, CL         | A-6    | 25-50                           | 55-70                                | 50-65  | 45-60  | 35-55 | 30-35           | 10-15                    |
|                          | 5-30  | Clay-----                                       | CH             | A-7    | 0-10                            | 85-95                                | 80-90  | 75-85  | 65-75 | 50-60           | 35-45                    |
|                          | 30-52 | Cobbly clay, gravelly clay loam, gravelly clay. | CL             | A-7    | 10-30                           | 75-90                                | 70-85  | 60-70  | 50-60 | 40-50           | 25-35                    |
|                          | 52-56 | Unweathered bedrock.                            | ---            | ---    | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| 252*:<br>Bucan-----      | 0-5   | Cobbly loam-----                                | CL             | A-6    | 20-25                           | 75-85                                | 70-80  | 65-75  | 50-60 | 30-35           | 10-15                    |
|                          | 5-15  | Clay-----                                       | CH             | A-7    | 0-10                            | 85-95                                | 80-90  | 75-85  | 65-75 | 50-60           | 35-45                    |
|                          | 15-42 | Cobbly clay, gravelly clay loam, gravelly clay. | CL             | A-7    | 10-30                           | 75-90                                | 70-85  | 60-70  | 50-60 | 40-50           | 25-35                    |
|                          | 42-46 | Unweathered bedrock.                            | ---            | ---    | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                            | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                             |       |                                                                                                         | Unified         | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                             | In    |                                                                                                         |                 |          | Pct                             |                                      |        |        |       | Pct                    |                          |
| 252*:<br>Humdun-----        | 0-6   | Silt loam-----                                                                                          | ML              | A-4      | 0                               | 100                                  | 100    | 90-100 | 70-90 | 30-40                  | NP-10                    |
|                             | 6-24  | Loam, very fine<br>sandy loam, silt<br>loam.                                                            | ML              | A-4      | 0                               | 100                                  | 100    | 85-95  | 60-80 | 30-40                  | NP-10                    |
|                             | 24-60 | Loam, very fine<br>sandy loam, silt<br>loam.                                                            | ML              | A-4      | 0                               | 100                                  | 100    | 85-95  | 60-80 | 30-40                  | NP-10                    |
| Rock outcrop.               |       |                                                                                                         |                 |          |                                 |                                      |        |        |       |                        |                          |
| 262*:<br>Chen-----          | 0-10  | Very gravelly<br>loam.                                                                                  | GC              | A-2      | 0-15                            | 50-65                                | 35-50  | 30-45  | 25-35 | 30-35                  | 10-15                    |
|                             | 10-16 | Very gravelly<br>clay, extremely<br>gravelly clay,<br>very cobbly<br>clay.                              | GC              | A-2, A-7 | 0-45                            | 35-50                                | 25-45  | 25-45  | 20-40 | 50-60                  | 25-35                    |
|                             | 16-20 | Unweathered<br>bedrock.                                                                                 | ---             | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Slaven-----                 | 0-5   | Loam-----                                                                                               | CL              | A-6      | 5-10                            | 85-95                                | 75-90  | 65-80  | 55-70 | 25-35                  | 10-15                    |
|                             | 5-22  | Extremely<br>gravelly clay,<br>extremely<br>gravelly sandy<br>clay, extremely<br>gravelly clay<br>loam. | GC              | A-2      | 0                               | 25-35                                | 15-25  | 15-20  | 10-20 | 40-50                  | 15-25                    |
|                             | 22    | Unweathered<br>bedrock.                                                                                 | ---             | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Chen, cobbly----            | 0-8   | Cobbly loam-----                                                                                        | SM-SC, SM       | A-4      | 20-25                           | 80-90                                | 60-80  | 55-70  | 40-50 | 25-35                  | 5-10                     |
|                             | 8-17  | Very gravelly<br>clay, very<br>cobbly clay,<br>extremely<br>gravelly clay.                              | GC              | A-2      | 5-45                            | 45-55                                | 30-50  | 25-40  | 25-35 | 45-60                  | 20-30                    |
|                             | 17    | Unweathered<br>bedrock.                                                                                 | ---             | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| 272*:<br>Cherry Spring---   | 0-7   | Very fine sandy<br>loam.                                                                                | ML              | A-4      | 0                               | 95-100                               | 95-100 | 85-95  | 70-80 | 20-25                  | NP-5                     |
|                             | 7-29  | Loam, silt loam,<br>clay loam.                                                                          | CL-ML, CL       | A-4, A-6 | 0-5                             | 90-100                               | 80-95  | 75-90  | 65-75 | 25-40                  | 5-20                     |
|                             | 29-41 | Cemented-----                                                                                           | ---             | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 41-60 | Stratified sandy<br>loam to<br>extremely<br>gravelly sandy<br>loam.                                     | GM              | A-1      | 0-5                             | 40-55                                | 35-50  | 30-40  | 15-25 | ---                    | NP                       |
| Enko-----                   | 0-7   | Very fine sandy<br>loam.                                                                                | CL-ML           | A-4      | 0                               | 95-100                               | 85-100 | 75-100 | 50-70 | 20-30                  | 5-10                     |
|                             | 7-15  | Loam, sandy loam,<br>fine sandy loam.                                                                   | SM-SC,<br>CL-ML | A-4      | 0                               | 95-100                               | 85-100 | 60-90  | 35-70 | 20-30                  | 5-10                     |
|                             | 15-60 | Sandy loam, fine<br>sandy loam,<br>loam.                                                                | SM-SC,<br>CL-ML | A-2, A-4 | 0                               | 85-100                               | 75-100 | 60-90  | 30-65 | 20-25                  | 5-10                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                           | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                          |       |                                                                        | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                          | In    |                                                                        |                |          | Pct                             |                                      |        |        |       | Pct             |                          |
| 282*:<br>Chiara-----     | 0-5   | Very fine sandy loam.                                                  | ML             | A-4      | 0                               | 95-100                               | 90-100 | 85-95  | 70-80 | 25-35           | NP-5                     |
|                          | 5-16  | Very fine sandy loam, loam, silt loam.                                 | ML             | A-4      | 0                               | 95-100                               | 90-100 | 80-95  | 70-80 | 25-35           | NP-5                     |
|                          | 16-20 | Indurated-----                                                         | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Orovada-----             | 0-8   | Very fine sandy loam.                                                  | ML             | A-4      | 0                               | 95-100                               | 90-100 | 80-95  | 60-75 | 25-35           | NP-5                     |
|                          | 8-20  | Fine sandy loam, loam.                                                 | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30           | NP-5                     |
|                          | 20-60 | Stratified fine sandy loam to silt loam.                               | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30           | NP-5                     |
| 283*:<br>Chiara-----     | 0-5   | Very fine sandy loam.                                                  | ML             | A-4      | 0                               | 95-100                               | 90-100 | 85-95  | 70-80 | 25-35           | NP-5                     |
|                          | 5-16  | Very fine sandy loam, loam, silt loam.                                 | ML             | A-4      | 0                               | 95-100                               | 90-100 | 80-95  | 70-80 | 25-35           | NP-5                     |
|                          | 16-20 | Indurated-----                                                         | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Tenabo-----              | 0-6   | Very fine sandy loam.                                                  | ML             | A-4      | 0                               | 95-100                               | 90-100 | 85-95  | 75-85 | 25-35           | NP-10                    |
|                          | 6-18  | Clay loam, silty clay loam, gravelly clay loam.                        | CL             | A-6      | 0                               | 95-100                               | 70-95  | 60-90  | 50-85 | 30-40           | 15-25                    |
|                          | 18-40 | Indurated-----                                                         | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
|                          | 40-60 | Stratified very gravelly sandy loam to extremely gravelly coarse sand. | GP-GM, GM      | A-1      | 5-25                            | 40-60                                | 35-55  | 25-35  | 5-20  | ---             | NP                       |
| 284*:<br>Chiara-----     | 0-5   | Gravelly loam----                                                      | SM             | A-4      | 0-5                             | 70-80                                | 55-70  | 50-65  | 35-50 | 15-25           | NP-5                     |
|                          | 5-16  | Very fine sandy loam, silt loam, loam.                                 | ML             | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 75-85 | 15-25           | NP-5                     |
|                          | 16-20 | Indurated-----                                                         | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Dewar-----               | 0-4   | Gravelly loam----                                                      | GC, CL, SC     | A-6      | 0-5                             | 60-90                                | 55-80  | 45-80  | 35-70 | 25-35           | 10-15                    |
|                          | 4-14  | Gravelly silty clay loam, gravelly clay loam.                          | GC, CL         | A-6, A-7 | 0-10                            | 65-90                                | 60-80  | 55-80  | 45-75 | 35-45           | 15-20                    |
|                          | 14-50 | Indurated-----                                                         | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| 285*:<br>Chiara-----     | 0-5   | Very gravelly loam.                                                    | GM             | A-1, A-2 | 0-5                             | 50-60                                | 35-50  | 30-45  | 20-35 | 15-25           | NP-5                     |
|                          | 5-16  | Very fine sandy loam, silt loam, loam.                                 | ML             | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 75-85 | 15-25           | NP-5                     |
|                          | 16-20 | Indurated-----                                                         | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                             | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|--------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                          |       |                                                                          | Unified                 | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                          | In    |                                                                          |                         |          | Pct                             |                                      |        |        |       | Pct                    |                          |
| 285*:<br>Trunk-----      | 0-5   | Cobbly loam-----                                                         | CL-ML, ML               | A-4      | 15-30                           | 75-95                                | 70-90  | 60-90  | 50-70 | 20-30                  | NP-10                    |
|                          | 5-28  | Gravelly clay,<br>gravelly clay<br>loam.                                 | CL, CH, GC              | A-7      | 0-10                            | 55-85                                | 50-80  | 45-75  | 40-65 | 40-55                  | 20-30                    |
|                          | 28-32 | Unweathered<br>bedrock.                                                  | ---                     | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Midraw-----              | 0-6   | Very cobbly loam                                                         | CL, GC                  | A-6, A-2 | 30-40                           | 50-75                                | 40-70  | 35-60  | 30-55 | 25-35                  | 10-15                    |
|                          | 6-16  | Gravelly clay,<br>gravelly clay<br>loam.                                 | GC, CL                  | A-7      | 0-10                            | 65-75                                | 55-70  | 50-65  | 45-60 | 40-50                  | 15-25                    |
|                          | 16-31 | Indurated-----                                                           | ---                     | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                          | 31    | Unweathered<br>bedrock.                                                  | ---                     | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| 286*:<br>Chiara-----     | 0-5   | Fine sandy loam                                                          | SM                      | A-4      | 0                               | 95-100                               | 90-100 | 65-75  | 40-50 | ---                    | NP                       |
|                          | 5-16  | Very fine sandy<br>loam, loam, silt<br>loam.                             | ML                      | A-4      | 0                               | 95-100                               | 90-100 | 80-95  | 70-80 | 25-35                  | NP-5                     |
|                          | 16-20 | Indurated-----                                                           | ---                     | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Jenor-----               | 0-6   | Fine sandy loam                                                          | SM, SM-SC,<br>ML, CL-ML | A-4      | 0                               | 90-100                               | 90-100 | 70-85  | 35-55 | 15-25                  | NP-10                    |
|                          | 6-16  | Fine sandy loam,<br>loam.                                                | SM, SM-SC               | A-4      | 0-5                             | 80-95                                | 75-95  | 60-75  | 35-50 | 15-25                  | NP-10                    |
|                          | 16-26 | Fine sandy loam,<br>sandy loam,<br>gravelly loam.                        | SM, SM-SC,<br>ML, CL-ML | A-4, A-2 | 0-5                             | 75-95                                | 60-90  | 50-75  | 30-60 | 15-25                  | NP-10                    |
|                          | 26-60 | Indurated-----                                                           | ---                     | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| 290, 291-----<br>Creemon | 0-10  | Silt loam-----                                                           | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | ---                    | NP                       |
|                          | 10-15 | Very fine sandy<br>loam, silt loam.                                      | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                          | 15-45 | Stratified very<br>fine sandy loam<br>to silt loam.                      | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                          | 45-60 | Stratified<br>gravelly very<br>fine sandy loam<br>to fine sandy<br>loam. | SM                      | A-4      | 0                               | 80-90                                | 70-85  | 60-70  | 35-50 | ---                    | NP                       |
| 292-----<br>Creemon      | 0-10  | Silt loam-----                                                           | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                          | 10-15 | Very fine sandy<br>loam, silt loam.                                      | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                          | 15-28 | Stratified very<br>fine sandy loam<br>to silt loam.                      | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                          | 28-60 | Stratified very<br>fine sandy loam<br>to silt loam.                      | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 25-30                  | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                             | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|--------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                          |       |                                                                          | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                          | In    |                                                                          |                |          | Pct                             |                                      |        |        |       | Pct             |                          |
| 293-----<br>Creemon      | 0-10  | Silt loam-----                                                           | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 10-15 | Very fine sandy<br>loam, silt loam.                                      | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 15-45 | Stratified very<br>fine sandy loam<br>to silt loam.                      | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 45-60 | Stratified<br>gravelly very<br>fine sandy loam<br>to fine sandy<br>loam. | SM             | A-4      | 0                               | 80-90                                | 70-85  | 60-70  | 35-50 | ---             | NP                       |
| 294*:<br>Creemon-----    | 0-10  | Very fine sandy<br>loam.                                                 | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80 | 25-30           | NP-5                     |
|                          | 10-15 | Very fine sandy<br>loam, silt loam.                                      | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 15-28 | Stratified very<br>fine sandy loam<br>to silt loam.                      | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 28-60 | Stratified very<br>fine sandy loam<br>to silt loam.                      | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 25-30           | NP-5                     |
| Orovada-----             | 0-8   | Very fine sandy<br>loam.                                                 | ML             | A-4      | 0                               | 95-100                               | 90-100 | 80-95  | 60-75 | 25-35           | NP-5                     |
|                          | 8-20  | Fine sandy loam,<br>loam.                                                | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30           | NP-5                     |
|                          | 20-60 | Stratified fine<br>sandy loam to<br>silt loam.                           | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30           | NP-5                     |
| Broyles-----             | 0-5   | Very fine sandy<br>loam.                                                 | SM, ML         | A-4      | 0                               | 90-100                               | 90-100 | 85-95  | 45-60 | ---             | NP                       |
|                          | 5-14  | Very fine sandy<br>loam.                                                 | SM, ML         | A-4      | 0                               | 90-100                               | 90-100 | 85-95  | 40-55 | ---             | NP                       |
|                          | 14-60 | Gravelly fine<br>sandy loam.                                             | SM             | A-1, A-2 | 0                               | 70-85                                | 55-70  | 45-60  | 15-30 | ---             | NP                       |
| 295*:<br>Creemon-----    | 0-10  | Silt loam-----                                                           | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | ---             | NP                       |
|                          | 10-15 | Very fine sandy<br>loam, silt loam.                                      | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 15-45 | Stratified very<br>fine sandy loam<br>to silt loam.                      | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 45-60 | Stratified<br>gravelly very<br>fine sandy loam<br>to fine sandy<br>loam. | SM             | A-4      | 0                               | 80-90                                | 70-85  | 60-70  | 35-50 | ---             | NP                       |
| Cren-----                | 0-7   | Silt loam-----                                                           | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 7-26  | Silt loam-----                                                           | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 26-60 | Stratified fine<br>sandy loam to<br>silt loam.                           | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                       | Classification  |        | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------------------|-----------------|--------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                             |       |                                                                                    | Unified         | AASHTO |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                             | In    |                                                                                    |                 |        | Pct                             |                                      |        |        |       |                        |                          |
| 296*:<br>Creemon-----       | 0-10  | Silt loam-----                                                                     | ML              | A-4    | 0                               | 100                                  | 100    | 95-100 | 85-90 | ---                    | NP                       |
|                             | 10-15 | Very fine sandy<br>loam, silt loam.                                                | ML              | A-4    | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                             | 15-45 | Stratified very<br>fine sandy loam<br>to silt loam.                                | ML              | A-4    | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                             | 45-60 | Stratified<br>gravelly very<br>fine sandy loam<br>to fine sandy<br>loam.           | SM              | A-4    | 0                               | 80-90                                | 70-85  | 60-70  | 35-50 | ---                    | NP                       |
| Hessing-----                | 0-4   | Silt loam-----                                                                     | CL-ML           | A-4    | 0                               | 100                                  | 100    | 95-100 | 85-95 | 25-30                  | 5-10                     |
|                             | 4-11  | Silt loam, silty<br>clay loam.                                                     | CL              | A-6    | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-40                  | 10-20                    |
|                             | 11-18 | Very fine sandy<br>loam, silt loam.                                                | CL-ML           | A-4    | 0                               | 95-100                               | 95-100 | 85-95  | 60-70 | 25-30                  | 5-10                     |
|                             | 18-30 | Gravelly loam----                                                                  | GM              | A-4    | 0                               | 60-70                                | 55-65  | 45-55  | 35-50 | 25-30                  | NP-5                     |
|                             | 30-60 | Stratified very<br>gravelly loamy<br>coarse sand to<br>extremely<br>gravelly sand. | GP-GM,<br>GW-GM | A-1    | 0                               | 35-45                                | 20-35  | 10-20  | 5-10  | ---                    | NP                       |
| 297*:<br>Creemon-----       | 0-10  | Silt loam-----                                                                     | ML              | A-4    | 0                               | 100                                  | 100    | 95-100 | 85-90 | ---                    | NP                       |
|                             | 10-15 | Very fine sandy<br>loam, silt loam.                                                | ML              | A-4    | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                             | 15-45 | Stratified very<br>fine sandy loam<br>to silt loam.                                | ML              | A-4    | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                             | 45-60 | Stratified<br>gravelly very<br>fine sandy loam<br>to fine sandy<br>loam.           | SM              | A-4    | 0                               | 80-90                                | 70-85  | 60-70  | 35-50 | ---                    | NP                       |
| Orovada-----                | 0-8   | Very fine sandy<br>loam.                                                           | ML              | A-4    | 0                               | 95-100                               | 90-100 | 80-95  | 60-75 | 25-35                  | NP-5                     |
|                             | 8-20  | Fine sandy loam,<br>loam.                                                          | SM, ML          | A-4    | 0                               | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30                  | NP-5                     |
|                             | 20-60 | Stratified fine<br>sandy loam to<br>silt loam.                                     | SM, ML          | A-4    | 0                               | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30                  | NP-5                     |
| Tulase-----                 | 0-6   | Very fine sandy<br>loam.                                                           | ML, CL-ML       | A-4    | 0                               | 100                                  | 100    | 95-100 | 60-70 | 15-25                  | NP-10                    |
|                             | 6-60  | Very fine sandy<br>loam, silt loam.                                                | CL-ML, ML       | A-4    | 0                               | 100                                  | 100    | 95-100 | 70-85 | 15-25                  | NP-10                    |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                          | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                             |       |                                                                                       | Unified                 | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                             | In    |                                                                                       |                         |          | Pct                             |                                      |        |        |       | Pct             |                          |
| 298*:<br>Creemon-----       | 0-10  | Silt loam-----                                                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | ---             | NP                       |
|                             | 10-15 | Very fine sandy<br>loam, silt loam.                                                   | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                             | 15-45 | Stratified very<br>fine sandy loam<br>to silt loam.                                   | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                             | 45-60 | Stratified<br>gravelly very<br>fine sandy loam<br>to fine sandy<br>loam.              | SM                      | A-4      | 0                               | 80-90                                | 70-85  | 60-70  | 35-50 | ---             | NP                       |
| Misad-----                  | 0-7   | Gravelly sandy<br>loam.                                                               | SM, SM-SC               | A-1, A-2 | 0-5                             | 65-80                                | 55-70  | 45-60  | 20-35 | 15-25           | NP-10                    |
|                             | 7-31  | Stratified fine<br>sandy loam to<br>very gravelly<br>sandy loam.                      | GM, GM-GC,<br>SM, SM-SC | A-1, A-2 | 5-10                            | 45-65                                | 40-60  | 25-40  | 10-25 | 15-25           | NP-10                    |
|                             | 31-60 | Stratified very<br>gravelly loamy<br>sand to<br>extremely<br>gravelly coarse<br>sand. | GP-GM                   | A-1      | 5-10                            | 40-55                                | 20-40  | 10-30  | 5-10  | ---             | NP                       |
| 300-----<br>Cren            | 0-7   | Silt loam-----                                                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                             | 7-26  | Silt loam-----                                                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                             | 26-60 | Stratified fine<br>sandy loam to<br>silt loam.                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
| 303*:<br>Cren-----          | 0-7   | Silt loam-----                                                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                             | 7-26  | Silt loam-----                                                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                             | 26-60 | Stratified fine<br>sandy loam to<br>silt loam.                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
| Doowak-----                 | 0-6   | Very gravelly<br>loamy sand.                                                          | GM, GP-GM               | A-1      | 5-10                            | 40-55                                | 30-45  | 15-30  | 5-15  | ---             | NP                       |
|                             | 6-60  | Stratified<br>extremely<br>gravelly sand to<br>extremely<br>gravelly loamy<br>sand.   | GP                      | A-1      | 5-10                            | 30-45                                | 10-25  | 5-20   | 0-5   | ---             | NP                       |
| Relley-----                 | 0-8   | Silt loam-----                                                                        | CL-ML, ML               | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 75-90 | 25-35           | 5-10                     |
|                             | 8-16  | Silt loam-----                                                                        | CL-ML, ML               | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 85-95 | 25-35           | 5-10                     |
|                             | 16-28 | Silt loam-----                                                                        | CL-ML, ML               | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 85-95 | 25-35           | 5-10                     |
|                             | 28-60 | Silt loam-----                                                                        | CL-ML, ML               | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 85-95 | 25-35           | 5-10                     |
| 304*:<br>Cren-----          | 0-7   | Silt loam-----                                                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                             | 7-26  | Silt loam-----                                                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                             | 26-60 | Stratified fine<br>sandy loam to<br>silt loam.                                        | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                 | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|--------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                          |       |                                                              | Unified         | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                          | In    |                                                              |                 |          | Pct                             |                                      |        |        |       |                        |                          |
| 304*:<br>Raglan-----     | 0-6   | Silt loam-----                                               | CL-ML, ML       | A-4      | 0                               | 95-100                               | 95-100 | 85-95  | 75-85 | 25-35                  | 5-10                     |
|                          | 6-14  | Silt loam-----                                               | CL-ML, CL       | A-4, A-6 | 0                               | 95-100                               | 95-100 | 85-95  | 75-85 | 25-40                  | 5-15                     |
|                          | 14-64 | Stratified very<br>fine sandy loam<br>to silty clay<br>loam. | CL, ML          | A-4, A-6 | 0                               | 95-100                               | 95-100 | 85-95  | 60-80 | 30-40                  | 5-15                     |
| Batan-----               | 0-5   | Silt loam-----                                               | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-35                  | 5-10                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay loam.               | CL              | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-40                  | 15-25                    |
| 310-----<br>Davey        | 0-5   | Fine sandy loam                                              | SM              | A-2      | 0                               | 100                                  | 100    | 80-95  | 25-35 | ---                    | NP                       |
|                          | 5-20  | Fine sandy loam,<br>sandy loam.                              | SM              | A-2, A-4 | 0                               | 100                                  | 100    | 80-90  | 30-40 | 20-25                  | NP-5                     |
|                          | 20-60 | Fine sand, loamy<br>fine sand.                               | SM              | A-2      | 0                               | 85-100                               | 85-100 | 70-80  | 10-20 | ---                    | NP                       |
| 312-----<br>Davey        | 0-20  | Fine sandy loam                                              | SM              | A-2, A-4 | 0                               | 100                                  | 100    | 80-90  | 30-40 | 20-25                  | NP-5                     |
|                          | 20-50 | Loamy fine sand                                              | SM              | A-2      | 0                               | 85-100                               | 85-100 | 70-80  | 20-30 | ---                    | NP                       |
|                          | 50-60 | Cemented-----                                                | ---             | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| 313*:<br>Davey-----      | 0-5   | Fine sandy loam                                              | SM              | A-2      | 0                               | 100                                  | 100    | 80-95  | 25-35 | ---                    | NP                       |
|                          | 5-20  | Fine sandy loam,<br>sandy loam.                              | SM              | A-2, A-4 | 0                               | 100                                  | 100    | 80-90  | 30-40 | 20-25                  | NP-5                     |
|                          | 20-60 | Fine sand, loamy<br>fine sand.                               | SM              | A-2      | 0                               | 85-100                               | 85-100 | 70-80  | 10-20 | ---                    | NP                       |
| Goldrun-----             | 0-7   | Fine sand-----                                               | SM              | A-2      | 0                               | 100                                  | 100    | 75-90  | 15-35 | ---                    | NP                       |
|                          | 7-67  | Fine sand-----                                               | SM              | A-2      | 0                               | 100                                  | 100    | 75-90  | 10-20 | ---                    | NP                       |
| 340-----<br>Duffer       | 0-4   | Very fine sandy<br>loam.                                     | ML, CL-ML       | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80 | 20-30                  | NP-10                    |
|                          | 4-29  | Silt loam, silty<br>clay loam.                               | CL              | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-45                  | 10-20                    |
|                          | 29-60 | Stratified very<br>fine sandy loam<br>to silty clay<br>loam. | CL, CL-ML       | A-6, A-4 | 0                               | 100                                  | 100    | 95-100 | 75-95 | 25-35                  | 5-15                     |
| 370-----<br>Enko         | 0-7   | Fine sandy loam                                              | SM-SC           | A-4      | 0                               | 95-100                               | 85-100 | 60-75  | 35-50 | 20-30                  | 5-10                     |
|                          | 7-15  | Loam, sandy loam,<br>fine sandy loam.                        | SM-SC,<br>CL-ML | A-4      | 0                               | 95-100                               | 85-100 | 60-90  | 35-70 | 20-30                  | 5-10                     |
|                          | 15-60 | Sandy loam, fine<br>sandy loam,<br>loam.                     | SM-SC,<br>CL-ML | A-2, A-4 | 0                               | 85-100                               | 75-100 | 60-90  | 30-65 | 20-25                  | 5-10                     |
| 371*:<br>Enko-----       | 0-7   | Fine sandy loam                                              | SM-SC           | A-4      | 0                               | 95-100                               | 85-100 | 60-75  | 35-50 | 20-30                  | 5-10                     |
|                          | 7-15  | Loam, sandy loam,<br>fine sandy loam.                        | SM-SC,<br>CL-ML | A-4      | 0                               | 95-100                               | 85-100 | 60-90  | 35-70 | 20-30                  | 5-10                     |
|                          | 15-60 | Sandy loam, fine<br>sandy loam,<br>loam.                     | SM-SC,<br>CL-ML | A-2, A-4 | 0                               | 85-100                               | 75-100 | 60-90  | 30-65 | 20-25                  | 5-10                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                 | Classification      |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------------------------------------------|---------------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                              | Unified             | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                          | In    |                                                                              |                     |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 371*:<br>Shabliss-----   | 0-6   | Very fine sandy loam.                                                        | ML                  | A-4      | 0-5                             | 95-100                               | 95-100 | 85-95 | 60-75 | ---             | NP                       |
|                          | 6-16  | Very fine sandy loam, loam, silt loam.                                       | ML                  | A-4      | 0-5                             | 95-100                               | 95-100 | 80-95 | 60-75 | ---             | NP                       |
|                          | 16-34 | Cemented-----                                                                | ---                 | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                          | 34-60 | Loamy sand, gravelly loamy sand.                                             | SM                  | A-1      | 0-5                             | 70-85                                | 60-80  | 35-50 | 10-25 | ---             | NP                       |
| Orovada-----             | 0-8   | Very fine sandy loam.                                                        | ML                  | A-4      | 0                               | 95-100                               | 90-100 | 80-95 | 60-75 | 25-35           | NP-5                     |
|                          | 8-20  | Fine sandy loam, loam.                                                       | SM, ML              | A-4      | 0                               | 75-100                               | 75-95  | 60-80 | 40-60 | 20-30           | NP-5                     |
|                          | 20-60 | Stratified fine sandy loam to silt loam.                                     | SM, ML              | A-4      | 0                               | 75-100                               | 75-95  | 60-85 | 35-55 | 20-30           | NP-5                     |
| 400*:<br>Glean-----      | 0-6   | Gravelly loam----                                                            | SM, GM              | A-2, A-4 | 0-10                            | 55-80                                | 50-75  | 40-60 | 25-40 | 20-30           | NP-5                     |
|                          | 6-49  | Very gravelly sandy loam, very gravelly loam.                                | GM                  | A-1, A-2 | 0-25                            | 30-65                                | 25-60  | 20-50 | 10-35 | 20-30           | NP-5                     |
|                          | 49-53 | Unweathered bedrock.                                                         | ---                 | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Walti-----               | 0-4   | Gravelly loam----                                                            | SM-SC, GM-GC, CL-ML | A-4      | 5-10                            | 65-80                                | 55-75  | 40-60 | 35-55 | 20-30           | 5-10                     |
|                          | 4-10  | Clay loam, gravelly clay loam.                                               | CL                  | A-6      | 0-10                            | 90-100                               | 65-90  | 60-80 | 50-65 | 35-40           | 15-20                    |
|                          | 10-30 | Clay, gravelly clay.                                                         | CH, MH              | A-7      | 0-10                            | 90-100                               | 65-90  | 60-80 | 50-75 | 55-65           | 25-35                    |
|                          | 30-34 | Unweathered bedrock.                                                         | ---                 | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Cleavage-----            | 0-4   | Extremely gravelly loam.                                                     | GM-GC               | A-2      | 0-10                            | 35-45                                | 15-25  | 10-25 | 10-20 | 25-30           | 5-10                     |
|                          | 4-15  | Very cobbly clay loam, extremely gravelly clay loam, very gravelly loam.     | GC                  | A-2      | 0-45                            | 40-55                                | 30-45  | 25-45 | 20-35 | 30-45           | 10-20                    |
|                          | 15-19 | Unweathered bedrock.                                                         | ---                 | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 411*:<br>Golconda-----   | 0-8   | Very fine sandy loam.                                                        | ML                  | A-4      | 5-10                            | 90-100                               | 90-100 | 75-90 | 50-70 | 15-25           | NP-5                     |
|                          | 8-27  | Gravelly clay loam, clay loam.                                               | GC, CL              | A-6, A-7 | 0                               | 60-95                                | 55-90  | 50-90 | 40-70 | 35-45           | 15-20                    |
|                          | 27-43 | Cemented-----                                                                | ---                 | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                          | 43-60 | Stratified very gravelly sandy loam to extremely gravelly loamy coarse sand. | GP-GM, GM, GP       | A-1      | 0                               | 20-55                                | 15-50  | 5-40  | 0-20  | ---             | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                           | Classification       |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------|----------------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                             |       |                                                                        | Unified              | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                             | In    |                                                                        |                      |          | Pct                             |                                      |        |        |       |                        |                          |
| 411*:<br>Blackhawk-----     | 0-8   | Very fine sandy loam.                                                  | ML                   | A-4      | 0                               | 95-100                               | 95-100 | 85-95  | 65-75 | ---                    | NP                       |
|                             | 8-14  | Silt loam, loam, very fine sandy loam.                                 | ML                   | A-4      | 0                               | 95-100                               | 95-100 | 85-95  | 70-80 | 30-35                  | NP-5                     |
|                             | 14-17 | Cemented-----                                                          | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 17-38 | Stratified loam to gravelly loamy coarse sand.                         | SM                   | A-1, A-2 | 0                               | 75-90                                | 70-85  | 35-50  | 10-30 | ---                    | NP                       |
|                             | 38-60 | Stratified very gravelly sandy loam to extremely gravelly coarse sand. | GP-GM, SP, GP, SP-SM | A-1      | 0                               | 45-60                                | 20-50  | 10-35  | 0-10  | ---                    | NP                       |
| 412*:<br>Golconda-----      | 0-10  | Gravelly very fine sandy loam.                                         | GM-GC                | A-4      | 0-10                            | 65-75                                | 55-65  | 45-65  | 35-50 | 20-30                  | 5-10                     |
|                             | 10-23 | Gravelly clay loam, clay loam, silty clay loam.                        | GC, CL               | A-6, A-7 | 0                               | 60-95                                | 55-90  | 50-90  | 40-70 | 35-45                  | 15-20                    |
|                             | 23-36 | Cemented-----                                                          | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 36-60 | Very gravelly loamy coarse sand, very gravelly sandy loam.             | GP-GM, GM            | A-1      | 0                               | 30-55                                | 25-50  | 10-40  | 5-20  | ---                    | NP                       |
| Dun Glen-----               | 0-3   | Very fine sandy loam.                                                  | ML                   | A-4      | 0                               | 95-100                               | 90-100 | 80-95  | 50-65 | 15-25                  | NP-5                     |
|                             | 3-10  | Silt loam, very fine sandy loam.                                       | ML                   | A-4      | 0                               | 95-100                               | 90-100 | 85-100 | 55-70 | 15-25                  | NP-5                     |
|                             | 10-60 | Fine sandy loam, very fine sandy loam.                                 | SM                   | A-4      | 0                               | 90-100                               | 85-100 | 70-85  | 35-50 | 15-25                  | NP-5                     |
| 413*:<br>Golconda-----      | 0-8   | Gravelly very fine sandy loam.                                         | GM-GC                | A-4      | 0-10                            | 65-75                                | 55-65  | 45-65  | 35-50 | 20-30                  | 5-10                     |
|                             | 8-27  | Gravelly clay loam, clay loam, silty clay loam.                        | GC, CL               | A-6, A-7 | 0                               | 60-95                                | 55-90  | 50-90  | 40-70 | 35-45                  | 15-20                    |
|                             | 27-43 | Cemented-----                                                          | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
|                             | 43-60 | Very gravelly loamy coarse sand, very gravelly sandy loam.             | GP-GM, GM            | A-1      | 0                               | 30-55                                | 25-50  | 10-40  | 5-20  | ---                    | NP                       |
| Blownout land.              |       |                                                                        |                      |          |                                 |                                      |        |        |       |                        |                          |
| 420-----                    | 0-7   | Fine sand-----                                                         | SM                   | A-2      | 0                               | 100                                  | 100    | 75-90  | 15-35 | ---                    | NP                       |
| Goldrun                     | 7-60  | Fine sand-----                                                         | SM                   | A-2      | 0                               | 100                                  | 100    | 75-90  | 10-20 | ---                    | NP                       |
| 422*:<br>Goldrun-----       | 0-7   | Loamy sand-----                                                        | SM                   | A-2      | 0                               | 100                                  | 100    | 75-90  | 15-35 | ---                    | NP                       |
|                             | 7-60  | Fine sand-----                                                         | SM                   | A-2      | 0                               | 100                                  | 100    | 75-90  | 10-20 | ---                    | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                              | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                          |       |                                                                                           | Unified                 | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                          | In    |                                                                                           |                         |          | Pct                             |                                      |        |        |       | Pct             |                          |
| 422*:<br>Old Camp-----   | 0-2   | Very cobbly loam                                                                          | GM, GM-GC,<br>SM, SM-SC | A-2, A-4 | 25-55                           | 60-70                                | 55-65  | 45-55  | 30-40 | 15-25           | NP-10                    |
|                          | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC                      | A-2, A-6 | 35-50                           | 40-55                                | 35-50  | 30-45  | 25-40 | 30-40           | 15-25                    |
|                          | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| 441*:<br>Gund-----       | 0-4   | Silt loam-----                                                                            | CL-ML, ML               | A-4      | 0                               | 100                                  | 100    | 95-100 | 80-90 | 25-35           | 5-10                     |
|                          | 4-23  | Silt loam-----                                                                            | CL-ML, CL               | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 80-90 | 25-35           | 5-15                     |
|                          | 23-60 | Silty clay, clay                                                                          | CH                      | A-7      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 50-60           | 25-35                    |
| Umlerland-----           | 0-4   | Silt loam-----                                                                            | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 60-80 | 25-35           | NP-10                    |
|                          | 4-31  | Silty clay loam,<br>silty clay,<br>clay.                                                  | CL, CH                  | A-7      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 40-55           | 20-30                    |
|                          | 31-60 | Silty clay loam,<br>silty clay,<br>clay.                                                  | CL, CH                  | A-7      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 40-55           | 20-30                    |
| 442*:<br>Gund-----       | 0-4   | Silt loam-----                                                                            | CL-ML, ML               | A-4      | 0                               | 100                                  | 100    | 95-100 | 80-90 | 25-35           | 5-10                     |
|                          | 4-23  | Silt loam-----                                                                            | CL-ML, CL               | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 80-90 | 25-35           | 5-15                     |
|                          | 23-60 | Silty clay, clay                                                                          | CH                      | A-7      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 50-60           | 25-35                    |
| Bubus-----               | 0-6   | Very fine sandy<br>loam.                                                                  | ML                      | A-4      | 0                               | 85-95                                | 75-90  | 70-80  | 50-60 | 25-30           | NP-5                     |
|                          | 6-60  | Stratified sandy<br>loam to silt<br>loam.                                                 | ML                      | A-4      | 0                               | 95-100                               | 90-100 | 80-90  | 50-60 | 25-30           | NP-5                     |
| Wendane-----             | 0-13  | Silt loam-----                                                                            | ML                      | A-4      | 0                               | 100                                  | 100    | 90-100 | 70-95 | 30-40           | NP-10                    |
|                          | 13-27 | Silt loam, very<br>fine sandy loam.                                                       | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80 | 30-40           | NP-10                    |
|                          | 27-60 | Stratified silt<br>loam to clay<br>loam.                                                  | CL, ML                  | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95 | 35-45           | 10-20                    |
| 443*:<br>Gund-----       | 0-4   | Silt loam-----                                                                            | CL-ML, ML               | A-4      | 0                               | 100                                  | 100    | 95-100 | 80-90 | 25-35           | 5-10                     |
|                          | 4-23  | Silt loam-----                                                                            | CL-ML, CL               | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 80-90 | 25-35           | 5-15                     |
|                          | 23-60 | Silty clay, clay                                                                          | CH                      | A-7      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 50-60           | 25-35                    |
| Batan-----               | 0-5   | Silt loam-----                                                                            | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-35           | 5-10                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay loam.                                            | CL                      | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-40           | 15-25                    |
| 461*:<br>Hapgood-----    | 0-17  | Very gravelly<br>loam.                                                                    | GM-GC                   | A-2      | 5-10                            | 50-60                                | 35-50  | 30-45  | 25-35 | 25-30           | 5-10                     |
|                          | 17-40 | Very gravelly<br>loam.                                                                    | GC, GM-GC               | A-2      | 5-25                            | 50-60                                | 35-50  | 30-40  | 20-35 | 25-35           | 5-15                     |
|                          | 40-60 | Very cobbly loam,<br>very gravelly<br>loam.                                               | GC, GM-GC               | A-2      | 15-40                           | 55-65                                | 50-60  | 35-45  | 25-35 | 25-35           | 5-15                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth       | USDA texture                                                                                                    | Classification             |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------------|-----------------------------------------------------------------------------------------------------------------|----------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |             |                                                                                                                 | Unified                    | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In          |                                                                                                                 |                            |          | Pct                             |                                      |       |       |       | Pct             |                          |
| 461*:<br>Packer-----        | 0-10        | Extremely<br>gravelly loam.                                                                                     | GM-GC,<br>GP-GC            | A-2      | 15-25                           | 30-40                                | 15-30 | 10-25 | 5-20  | 20-30           | 5-10                     |
|                             | 10-21       | Extremely cobbly<br>clay loam,<br>extremely cobbly<br>loam.                                                     | GC                         | A-2      | 40-55                           | 40-55                                | 30-45 | 25-40 | 15-30 | 30-40           | 10-15                    |
|                             | 21-60       | Extremely cobbly<br>sandy loam,<br>extremely cobbly<br>loam.                                                    | GM                         | A-1      | 40-55                           | 40-55                                | 30-45 | 20-35 | 10-25 | 20-25           | NP-5                     |
| Layview-----                | 0-3         | Very gravelly<br>sandy loam.                                                                                    | GM-GC                      | A-2      | 10-15                           | 35-60                                | 30-55 | 20-35 | 10-20 | 25-30           | 5-10                     |
|                             | 3-12        | Very gravelly<br>loam, very<br>gravelly clay<br>loam.                                                           | GC                         | A-2, A-6 | 10-15                           | 35-60                                | 30-55 | 25-45 | 20-40 | 30-40           | 15-20                    |
|                             | 12          | Unweathered<br>bedrock.                                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 466*:<br>Hapgood-----       | 0-17        | Very gravelly<br>loam.                                                                                          | GM-GC                      | A-2      | 5-10                            | 50-60                                | 35-50 | 30-45 | 25-35 | 25-30           | 5-10                     |
|                             | 17-40       | Very gravelly<br>loam.                                                                                          | GC, GM-GC                  | A-2      | 5-25                            | 50-60                                | 35-50 | 30-40 | 20-35 | 25-35           | 5-15                     |
|                             | 40-60       | Very cobbly loam,<br>very gravelly<br>loam.                                                                     | GC, GM-GC                  | A-2      | 15-40                           | 55-65                                | 50-60 | 35-45 | 25-35 | 25-35           | 5-15                     |
| Tusel-----                  | 0-20        | Very gravelly<br>loam.                                                                                          | GM                         | A-2      | 0-15                            | 50-60                                | 40-50 | 35-45 | 25-35 | 25-35           | NP-10                    |
|                             | 20-42       | Extremely<br>gravelly sandy<br>clay loam,<br>extremely<br>gravelly clay<br>loam, very<br>gravelly clay<br>loam. | GC                         | A-2      | 15-45                           | 30-50                                | 25-40 | 20-35 | 15-30 | 30-40           | 10-20                    |
|                             | 42          | Unweathered<br>bedrock.                                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Winada-----                 | 0-12        | Gravelly loam----                                                                                               | GM-GC,<br>SM-SC,<br>SM, GM | A-4      | 0-5                             | 65-80                                | 55-70 | 50-65 | 35-50 | 20-30           | NP-10                    |
|                             | 12-24       | Very gravelly<br>clay loam.                                                                                     | GC                         | A-2      | 0-5                             | 45-55                                | 35-50 | 35-45 | 25-35 | 35-45           | 15-20                    |
|                             | 24-36<br>36 | Weathered bedrock<br>Unweathered<br>bedrock.                                                                    | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 467*:<br>Hapgood-----       | 0-17        | Very gravelly<br>loam.                                                                                          | GM-GC                      | A-2      | 5-10                            | 50-60                                | 35-50 | 30-45 | 25-35 | 25-30           | 5-10                     |
|                             | 17-40       | Very gravelly<br>loam.                                                                                          | GC, GM-GC                  | A-2      | 5-25                            | 50-60                                | 35-50 | 30-40 | 20-35 | 25-35           | 5-15                     |
|                             | 40-60       | Very cobbly loam,<br>very gravelly<br>loam.                                                                     | GC, GM-GC                  | A-2      | 15-40                           | 55-65                                | 50-60 | 35-45 | 25-35 | 25-35           | 5-15                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                             | Classification |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|--------------------------------------------------------------------------|----------------|---------------|---------------------------------|--------------------------------------|-------|--------|-------|-----------------|--------------------------|
|                          |       |                                                                          | Unified        | AASHTO        |                                 | 4                                    | 10    | 40     | 200   |                 |                          |
|                          | In    |                                                                          |                |               | Pct                             |                                      |       |        |       | Pct             |                          |
| 467*:<br>Sumine-----     | 0-6   | Very gravelly loam.                                                      | GM-GC          | A-2, A-4      | 10-15                           | 50-65                                | 45-60 | 40-50  | 30-40 | 20-30           | 5-10                     |
|                          | 6-28  | Very gravelly clay loam, very cobbly clay loam, very gravelly loam.      | GC             | A-2, A-6, A-7 | 15-40                           | 45-70                                | 35-65 | 30-50  | 25-45 | 35-45           | 15-25                    |
|                          | 28    | Unweathered bedrock.                                                     | ---            | ---           | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |
| Cleavage-----            | 0-4   | Extremely gravelly loam.                                                 | GM-GC          | A-2           | 0-10                            | 35-45                                | 15-25 | 10-25  | 10-20 | 25-30           | 5-10                     |
|                          | 4-15  | Very cobbly clay loam, extremely gravelly clay loam, very gravelly loam. | GC             | A-2           | 0-45                            | 40-55                                | 30-45 | 25-45  | 20-35 | 30-45           | 10-20                    |
|                          | 15-19 | Unweathered bedrock.                                                     | ---            | ---           | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |
| 482*:<br>Humdun-----     | 0-6   | Silt loam-----                                                           | ML             | A-4           | 0                               | 100                                  | 100   | 90-100 | 70-90 | 30-40           | NP-5                     |
|                          | 6-24  | Loam, very fine sandy loam, silt loam.                                   | ML             | A-4           | 0                               | 100                                  | 100   | 85-95  | 60-80 | 30-40           | NP-5                     |
|                          | 24-41 | Loam, very fine sandy loam, silt loam.                                   | ML             | A-4           | 0                               | 100                                  | 100   | 85-95  | 60-80 | 30-40           | NP-5                     |
|                          | 41-60 | Very gravelly loam.                                                      | GM             | A-2, A-1      | 5-10                            | 40-55                                | 35-50 | 25-40  | 20-30 | 20-30           | NP-5                     |
| Havingdon-----           | 0-3   | Gravelly silt loam.                                                      | GM, GM-GC      | A-4           | 0-10                            | 60-70                                | 50-65 | 50-60  | 35-50 | 25-35           | 5-10                     |
|                          | 3-22  | Very gravelly clay, very gravelly sandy clay, extremely gravelly clay.   | GC             | A-2           | 0                               | 30-40                                | 15-35 | 15-30  | 10-25 | 40-50           | 15-25                    |
|                          | 22-26 | Unweathered bedrock.                                                     | ---            | ---           | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |
| Bucan-----               | 0-5   | Cobbly loam-----                                                         | CL             | A-6           | 20-25                           | 75-85                                | 70-80 | 65-75  | 50-60 | 30-35           | 10-15                    |
|                          | 5-15  | Clay-----                                                                | CH             | A-7           | 0-10                            | 85-95                                | 80-90 | 75-85  | 65-75 | 50-60           | 35-45                    |
|                          | 15-42 | Cobbly clay, gravelly clay loam, gravelly clay.                          | CL             | A-7           | 10-30                           | 75-90                                | 70-85 | 60-70  | 50-60 | 40-50           | 25-35                    |
|                          | 42-46 | Unweathered bedrock.                                                     | ---            | ---           | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |
| 486*:<br>Havingdon-----  | 0-3   | Gravelly loam----                                                        | GM-GC, SM-SC   | A-4           | 0                               | 55-80                                | 50-75 | 45-60  | 35-50 | 20-30           | 5-10                     |
|                          | 3-22  | Very gravelly clay, very gravelly sandy clay, extremely gravelly clay.   | GC             | A-2           | 0                               | 30-40                                | 15-35 | 15-30  | 10-25 | 40-50           | 15-25                    |
|                          | 22-26 | Unweathered bedrock.                                                     | ---            | ---           | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                           | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
|                             |       |                                                                        | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                 |                          |
|                             | In    |                                                                        |                |          | Pct                             |                                      |        |        |        | Pct             |                          |
| 486*:<br>Burrita-----       | 0-3   | Extremely cobbly loam.                                                 | GM-GC          | A-2, A-4 | 40-60                           | 35-65                                | 30-55  | 25-50  | 20-40  | 15-25           | 5-10                     |
|                             | 3-18  | Very cobbly clay, very stony clay loam, very gravelly clay loam.       | GC, SC         | A-2, A-7 | 10-55                           | 35-75                                | 30-55  | 25-50  | 20-45  | 40-55           | 20-30                    |
|                             | 18-22 | Unweathered bedrock.                                                   | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---             | ---                      |
| 511-----<br>Hessing         | 0-4   | Silt loam-----                                                         | CL-ML          | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 25-30           | 5-10                     |
|                             | 4-11  | Silt loam, silty clay loam.                                            | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40           | 10-20                    |
|                             | 11-18 | Very fine sandy loam, silt loam.                                       | CL-ML          | A-4      | 0                               | 95-100                               | 95-100 | 85-95  | 60-70  | 25-30           | 5-10                     |
|                             | 18-30 | Gravelly loam----                                                      | GM             | A-4      | 0                               | 60-70                                | 55-65  | 45-55  | 35-50  | 25-30           | NP-5                     |
|                             | 30-60 | Stratified very gravelly loamy coarse sand to extremely gravelly sand. | GP-GM, GW-GM   | A-1      | 0                               | 35-45                                | 20-35  | 10-20  | 5-10   | ---             | NP                       |
| 512*:<br>Hessing-----       | 0-4   | Gravelly silt loam.                                                    | CL-ML          | A-4      | 0                               | 75-85                                | 60-75  | 55-65  | 50-60  | 25-30           | 5-10                     |
|                             | 4-11  | Silt loam, silty clay loam.                                            | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40           | 10-20                    |
|                             | 11-18 | Very fine sandy loam, silt loam.                                       | CL-ML          | A-4      | 0                               | 95-100                               | 95-100 | 85-95  | 60-70  | 25-30           | 5-10                     |
|                             | 18-30 | Gravelly loam----                                                      | GM             | A-4      | 0                               | 60-70                                | 55-65  | 45-55  | 35-50  | 25-30           | NP-5                     |
|                             | 30-60 | Stratified very gravelly loamy coarse sand to extremely gravelly sand. | GP-GM, GW-GM   | A-1      | 0                               | 35-45                                | 20-35  | 10-20  | 5-10   | ---             | NP                       |
| Relley-----                 | 0-8   | Silt loam-----                                                         | CL-ML, ML      | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 75-90  | 25-35           | 5-10                     |
|                             | 8-16  | Silt loam-----                                                         | CL-ML, ML      | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 16-28 | Silt loam-----                                                         | CL-ML, ML      | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 28-60 | Silt loam-----                                                         | CL-ML, ML      | A-4      | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
| 530-----<br>Humboldt        | 0-11  | Fine sandy loam                                                        | SM             | A-4      | 0                               | 100                                  | 100    | 90-100 | 40-50  | 15-25           | NP-5                     |
|                             | 11-60 | Stratified silty clay loam to clay.                                    | MH             | A-7      | 0                               | 90-100                               | 90-100 | 85-100 | 80-100 | 50-60           | 15-25                    |
| 531-----<br>Humboldt        | 0-11  | Silty clay-----                                                        | MH             | A-7      | 0                               | 100                                  | 100    | 100    | 90-100 | 50-60           | 20-25                    |
|                             | 11-67 | Stratified silty clay loam to clay.                                    | MH             | A-7      | 0                               | 90-100                               | 90-100 | 85-100 | 80-100 | 50-60           | 15-25                    |
| 532-----<br>Humboldt        | 0-11  | Silty clay loam                                                        | CL             | A-7      | 0                               | 100                                  | 100    | 100    | 90-100 | 40-50           | 20-25                    |
|                             | 11-60 | Stratified silty clay loam to clay.                                    | MH             | A-7      | 0                               | 90-100                               | 90-100 | 85-100 | 80-100 | 50-60           | 15-25                    |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                    | Classification       |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------|----------------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                             |       |                                                                                 | Unified              | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                             | In    |                                                                                 |                      |          | Pct                             |                                      |        |        |       | Pct             |                          |
| 571*:<br>Jenor-----         | 0-6   | Very fine sandy loam.                                                           | ML, CL-ML            | A-4      | 0                               | 90-100                               | 90-100 | 80-95  | 50-65 | 15-25           | NP-10                    |
|                             | 6-16  | Fine sandy loam, loam.                                                          | SM, SM-SC            | A-4      | 0-5                             | 80-95                                | 75-95  | 60-75  | 35-50 | 15-25           | NP-10                    |
|                             | 16-26 | Fine sandy loam, sandy loam, gravelly loam.                                     | SM, SM-SC, ML, CL-ML | A-4, A-2 | 0-5                             | 75-95                                | 60-90  | 50-75  | 30-60 | 15-25           | NP-10                    |
|                             | 26-60 | Indurated-----                                                                  | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Blacka-----                 | 0-8   | Very fine sandy loam.                                                           | ML                   | A-4      | 0                               | 100                                  | 100    | 85-95  | 50-65 | ---             | NP                       |
|                             | 8-21  | Fine sandy loam, very fine sandy loam.                                          | SM, ML               | A-4      | 0                               | 100                                  | 100    | 70-90  | 40-60 | 25-30           | NP-5                     |
|                             | 21-31 | Cemented-----                                                                   | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
|                             | 31-64 | Stratified sandy loam to loam.                                                  | SM                   | A-4      | 0                               | 100                                  | 100    | 65-85  | 35-50 | 20-25           | NP-5                     |
| 573*:<br>Jenor-----         | 0-6   | Very fine sandy loam.                                                           | ML, CL-ML            | A-4      | 0                               | 90-100                               | 90-100 | 80-95  | 50-65 | 15-25           | NP-10                    |
|                             | 6-16  | Fine sandy loam, loam.                                                          | SM, SM-SC            | A-4      | 0-5                             | 80-95                                | 75-95  | 60-75  | 35-50 | 15-25           | NP-10                    |
|                             | 16-26 | Fine sandy loam, sandy loam, gravelly loam.                                     | SM, SM-SC, ML, CL-ML | A-4, A-2 | 0-5                             | 75-95                                | 60-90  | 50-75  | 30-60 | 15-25           | NP-10                    |
|                             | 26-60 | Indurated-----                                                                  | ---                  | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Beoska-----                 | 0-13  | Very fine sandy loam.                                                           | ML, SM               | A-4      | 0                               | 85-95                                | 75-95  | 70-80  | 45-65 | 15-25           | NP-5                     |
|                             | 13-24 | Silt loam, silty clay loam.                                                     | CL                   | A-6, A-7 | 0                               | 80-100                               | 75-100 | 70-85  | 60-85 | 35-45           | 15-25                    |
|                             | 24-55 | Stratified gravelly very fine sandy loam to gravelly sandy loam.                | GM, SM               | A-1, A-2 | 0-10                            | 55-80                                | 50-75  | 30-50  | 20-35 | 15-25           | NP-5                     |
|                             | 55-60 | Stratified very gravelly sandy loam to extremely gravelly very fine sandy loam. | GM                   | A-1      | 0-15                            | 30-55                                | 25-50  | 15-35  | 10-25 | 15-25           | NP-5                     |
| Broyles-----                | 0-11  | Very fine sandy loam.                                                           | ML                   | A-4      | 0                               | 100                                  | 95-100 | 85-95  | 60-75 | ---             | NP                       |
|                             | 11-60 | Stratified loam to gravelly loamy sand.                                         | SM                   | A-2      | 0                               | 70-100                               | 60-95  | 30-40  | 25-35 | ---             | NP                       |
| 590-----<br>Landco          | 0-18  | Silt loam-----                                                                  | ML                   | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 20-25           | NP-5                     |
|                             | 18-44 | Silty clay, silty clay loam.                                                    | CL, CH               | A-7      | 0                               | 100                                  | 100    | 95-100 | 90-95 | 40-55           | 20-30                    |
|                             | 44-69 | Silt loam-----                                                                  | CL                   | A-6      | 0                               | 100                                  | 100    | 95-100 | 90-95 | 30-35           | 10-15                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                      | Classification       |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|-----------------------------------------------------------------------------------|----------------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                             |       |                                                                                   | Unified              | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                             | In    |                                                                                   |                      |          | Pct                             |                                      |        |        |       |                        |                          |
| 602-----<br>Misad           | 0-7   | Gravelly sandy loam.                                                              | SM, SM-SC            | A-1, A-2 | 0-5                             | 65-80                                | 55-70  | 45-60  | 20-35 | 15-25                  | NP-10                    |
|                             | 7-31  | Stratified fine sandy loam to very gravelly sandy loam.                           | GM, GM-GC, SM, SM-SC | A-1, A-2 | 5-10                            | 45-65                                | 40-60  | 25-40  | 10-25 | 15-25                  | NP-10                    |
|                             | 31-60 | Stratified very gravelly loamy sand to extremely gravelly coarse sand.            | GP-GM                | A-1      | 5-10                            | 40-55                                | 20-40  | 10-30  | 5-10  | ---                    | NP                       |
| 605*:<br>Misad-----         | 0-7   | Gravelly loam----                                                                 | SM, SM-SC, GM, GM-GC | A-2, A-4 | 0-5                             | 65-80                                | 55-70  | 50-65  | 30-50 | 15-25                  | NP-10                    |
|                             | 7-31  | Stratified fine sandy loam to very gravelly sandy loam.                           | GM, GM-GC, SM, SM-SC | A-1, A-2 | 5-10                            | 45-65                                | 40-60  | 25-40  | 10-25 | 15-25                  | NP-10                    |
|                             | 31-60 | Stratified very gravelly loamy sand to extremely gravelly coarse sand.            | GP-GM                | A-1      | 5-10                            | 40-55                                | 20-40  | 10-30  | 5-10  | ---                    | NP                       |
| Creemon-----                | 0-10  | Silt loam-----                                                                    | ML                   | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | ---                    | NP                       |
|                             | 10-15 | Very fine sandy loam, silt loam.                                                  | ML                   | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                             | 15-45 | Stratified very fine sandy loam to silt loam.                                     | ML                   | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                             | 45-60 | Stratified gravelly very fine sandy loam to fine sandy loam.                      | SM                   | A-4      | 0                               | 80-90                                | 70-85  | 60-70  | 35-50 | ---                    | NP                       |
| Rednik-----                 | 0-6   | Silt loam-----                                                                    | ML                   | A-4      | 0-5                             | 90-100                               | 90-100 | 80-95  | 60-75 | 20-30                  | NP-5                     |
|                             | 6-17  | Very gravelly sandy loam, extremely gravelly loam, very gravelly sandy clay loam. | GC, GM-GC            | A-2      | 5-30                            | 35-60                                | 30-50  | 20-35  | 15-30 | 25-35                  | 5-15                     |
|                             | 17-60 | Very gravelly sandy loam, very gravelly sand, extremely gravelly loamy sand.      | GP-GM, GM            | A-1      | 5-30                            | 35-60                                | 30-50  | 15-35  | 5-25  | ---                    | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                            | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|-----------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
|                          |       |                                                                                         | Unified                 | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                 |                          |
|                          | In    |                                                                                         |                         |          | Pct                             |                                      |        |        |        | Pct             |                          |
| 631*:<br>McConnel-----   | 0-2   | Loam-----                                                                               | ML                      | A-4      | 0                               | 95-100                               | 85-95  | 70-80  | 50-60  | 15-25           | NP-5                     |
|                          | 2-12  | Loam, sandy loam,<br>fine sandy loam.                                                   | ML, SM                  | A-4      | 0                               | 95-100                               | 90-100 | 65-80  | 45-60  | 15-25           | NP-5                     |
|                          | 12-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly coarse<br>sand.   | GP                      | A-1      | 0-15                            | 25-35                                | 10-35  | 5-15   | 0-5    | ---             | NP                       |
| Tulase-----              | 0-6   | Silt loam-----                                                                          | CL-ML, ML               | A-4      | 0                               | 100                                  | 100    | 100    | 90-100 | 15-25           | NP-10                    |
|                          | 6-60  | Very fine sandy<br>loam, silt loam.                                                     | CL-ML, ML               | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-85  | 15-25           | NP-10                    |
| 660-----<br>Needle Peak  | 0-4   | Silt loam-----                                                                          | CL, ML                  | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-90  | 30-45           | 10-15                    |
|                          | 4-60  | Silt loam, silty<br>clay loam.                                                          | CL, ML                  | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-95  | 30-50           | 10-20                    |
| 670*:<br>Filiran-----    | 0-7   | Silt loam-----                                                                          | ML, CL-ML               | A-4      | 0                               | 90-100                               | 90-100 | 80-95  | 50-70  | 15-25           | NP-10                    |
|                          | 7-12  | Gravelly silt<br>loam.                                                                  | GM-GC, GC,<br>SM-SC, SC | A-4, A-6 | 0-5                             | 65-80                                | 55-70  | 45-60  | 35-50  | 20-35           | 5-20                     |
|                          | 12-33 | Clay, silty clay<br>loam, gravelly<br>clay.                                             | CL, CH                  | A-7      | 0                               | 80-100                               | 70-90  | 65-85  | 60-80  | 40-55           | 25-35                    |
|                          | 33-60 | Cemented-----                                                                           | ---                     | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---             | ---                      |
| Pineval-----             | 0-5   | Gravelly fine<br>sandy loam.                                                            | SM-SC                   | A-2      | 0                               | 65-85                                | 60-75  | 50-70  | 20-35  | 20-30           | 5-10                     |
|                          | 5-11  | Very gravelly<br>clay loam, very<br>gravelly loam,<br>very gravelly<br>sandy clay loam. | GC                      | A-2      | 0                               | 35-60                                | 25-50  | 20-40  | 15-35  | 30-40           | 10-15                    |
|                          | 11-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly sand.             | GP-GM, GM               | A-1      | 0-25                            | 30-60                                | 20-50  | 15-40  | 5-20   | ---             | NP                       |
| Kingingham-----          | 0-7   | Gravelly very<br>fine sandy loam.                                                       | SM                      | A-2, A-4 | 0-5                             | 70-85                                | 55-70  | 50-65  | 30-50  | 15-25           | NP-5                     |
|                          | 7-22  | Gravelly clay<br>loam, gravelly<br>clay, gravelly<br>silty clay loam.                   | GC, CL, CH              | A-7      | 0-5                             | 70-85                                | 55-70  | 50-65  | 45-60  | 40-55           | 20-30                    |
|                          | 22-60 | Indurated-----                                                                          | ---                     | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---             | ---                      |
| 680*:<br>Skullwak-----   | 0-10  | Silt loam-----                                                                          | CL                      | A-6      | 0                               | 100                                  | 100    | 90-100 | 85-100 | 30-40           | 10-20                    |
|                          | 10-60 | Stratified silty<br>clay loam to<br>silty clay.                                         | CH, CL                  | A-7      | 0                               | 100                                  | 100    | 95-100 | 90-100 | 40-60           | 20-40                    |
| Umberland-----           | 0-4   | Silt loam-----                                                                          | ML                      | A-4      | 0                               | 100                                  | 100    | 95-100 | 60-80  | 25-35           | NP-10                    |
|                          | 4-60  | Silty clay, silty<br>clay loam.                                                         | CL, CH                  | A-7      | 0                               | 100                                  | 100    | 90-100 | 85-95  | 40-55           | 20-30                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                   | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                             |       |                                                | Unified         | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                             | In    |                                                |                 |          | Pct                             |                                      |        |        |       |                        |                          |
| 680*:<br>Wendane-----       | 0-13  | Silt loam-----                                 | ML              | A-4      | 0                               | 100                                  | 100    | 90-100 | 70-95 | 30-40                  | NP-10                    |
|                             | 13-27 | Silt loam, very<br>fine sandy loam.            | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80 | 30-40                  | NP-10                    |
|                             | 27-60 | Stratified silt<br>loam to clay<br>loam.       | CL, ML          | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95 | 35-45                  | 10-20                    |
| 684-----<br>Ocala           | 0-13  | Silt loam-----                                 | ML, CL          | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-40                  | 5-15                     |
|                             | 13-60 | Silt loam, silty<br>clay loam.                 | ML, CL          | A-6, A-7 | 0                               | 90-100                               | 90-100 | 90-95  | 85-90 | 30-50                  | 10-20                    |
| 700-----<br>Orovada         | 0-8   | Fine sandy loam                                | SM              | A-2, A-4 | 0                               | 95-100                               | 90-100 | 75-95  | 30-50 | ---                    | NP                       |
|                             | 8-20  | Fine sandy loam,<br>loam.                      | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30                  | NP-5                     |
|                             | 20-60 | Stratified fine<br>sandy loam to<br>silt loam. | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30                  | NP-5                     |
| 701-----<br>Orovada         | 0-8   | Fine sandy loam                                | SM              | A-2, A-4 | 0                               | 95-100                               | 90-100 | 75-95  | 30-50 | ---                    | NP                       |
|                             | 8-20  | Fine sandy loam,<br>loam.                      | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30                  | NP-5                     |
|                             | 20-65 | Stratified fine<br>sandy loam to<br>silt loam. | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30                  | NP-5                     |
| 702-----<br>Orovada         | 0-8   | Fine sandy loam                                | SM              | A-2, A-4 | 0                               | 95-100                               | 90-100 | 75-95  | 30-50 | ---                    | NP                       |
|                             | 8-20  | Fine sandy loam,<br>loam.                      | SM, ML          | A-4      | 0                               | 80-100                               | 80-95  | 65-80  | 40-60 | 20-30                  | NP-5                     |
|                             | 20-45 | Stratified fine<br>sandy loam to<br>silt loam. | SM              | A-4      | 0                               | 80-100                               | 80-95  | 65-80  | 35-50 | 20-30                  | NP-5                     |
|                             | 45-60 | Cemented-----                                  | ---             | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| 703*:<br>Orovada-----       | 0-8   | Fine sandy loam                                | SM              | A-2, A-4 | 0                               | 95-100                               | 90-100 | 75-95  | 30-50 | ---                    | NP                       |
|                             | 8-20  | Fine sandy loam,<br>loam.                      | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30                  | NP-5                     |
|                             | 20-60 | Stratified fine<br>sandy loam to<br>silt loam. | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30                  | NP-5                     |
| Goldrun-----                | 0-7   | Fine sand-----                                 | SM              | A-2      | 0                               | 100                                  | 100    | 75-90  | 15-35 | ---                    | NP                       |
|                             | 7-67  | Fine sand-----                                 | SM              | A-2      | 0                               | 100                                  | 100    | 75-90  | 10-20 | ---                    | NP                       |
| 704*:<br>Orovada-----       | 0-8   | Loam-----                                      | ML              | A-4      | 0                               | 95-100                               | 90-100 | 80-95  | 60-75 | 25-35                  | NP-5                     |
|                             | 8-20  | Fine sandy loam,<br>loam.                      | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30                  | NP-5                     |
|                             | 20-60 | Stratified fine<br>sandy loam to<br>silt loam. | SM, ML          | A-4      | 0                               | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30                  | NP-5                     |
| Kodra-----                  | 0-4   | Silt loam-----                                 | ML, CL-ML       | A-4      | 0                               | 85-100                               | 75-100 | 65-90  | 60-80 | 20-30                  | NP-10                    |
|                             | 4-30  | Loam, sandy loam                               | SM-SC,<br>CL-ML | A-4, A-2 | 0                               | 85-100                               | 75-100 | 55-80  | 30-60 | 20-25                  | 5-10                     |
|                             | 30-51 | Cemented-----                                  | ---             | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                 | Classification |               | Frag-ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|--------------------------------------------------------------|----------------|---------------|-----------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                          |       |                                                              | Unified        | AASHTO        |                             | 4                                    | 10     | 40     | 200   |                 |                          |
|                          | In    |                                                              |                |               | Pct                         |                                      |        |        |       | Pct             |                          |
| 704*:<br>Puett-----      | 0-4   | Gravelly sandy loam.                                         | GM, SM         | A-2           | 5-10                        | 55-80                                | 50-75  | 40-60  | 25-35 | 15-20           | NP-5                     |
|                          | 4-15  | Coarse sandy loam, gravelly sandy loam, loam.                | SM, ML, GM     | A-1, A-2, A-4 | 0                           | 55-95                                | 50-90  | 30-80  | 15-55 | ---             | NP                       |
|                          | 15    | Weathered bedrock                                            | ---            | ---           | ---                         | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| 705*:<br>Orovada-----    | 0-8   | Fine sandy loam                                              | SM             | A-2, A-4      | 0                           | 95-100                               | 90-100 | 75-95  | 30-50 | ---             | NP                       |
|                          | 8-20  | Fine sandy loam, loam.                                       | SM, ML         | A-4           | 0                           | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30           | NP-5                     |
|                          | 20-60 | Stratified fine sandy loam to silt loam.                     | SM, ML         | A-4           | 0                           | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30           | NP-5                     |
| Creemon-----             | 0-10  | Silt loam-----                                               | ML             | A-4           | 0                           | 100                                  | 100    | 95-100 | 85-90 | ---             | NP                       |
|                          | 10-15 | Very fine sandy loam, silt loam.                             | ML             | A-4           | 0                           | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 15-45 | Stratified very fine sandy loam to silt loam.                | ML             | A-4           | 0                           | 100                                  | 100    | 95-100 | 85-90 | 25-30           | NP-5                     |
|                          | 45-60 | Stratified gravelly very fine sandy loam to fine sandy loam. | SM             | A-4           | 0                           | 80-90                                | 70-85  | 60-70  | 35-50 | ---             | NP                       |
| 706*:<br>Orovada-----    | 0-8   | Fine sandy loam                                              | SM             | A-2, A-4      | 0                           | 95-100                               | 90-100 | 75-95  | 30-50 | ---             | NP                       |
|                          | 8-20  | Fine sandy loam, loam.                                       | SM, ML         | A-4           | 0                           | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30           | NP-5                     |
|                          | 20-60 | Stratified fine sandy loam to silt loam.                     | SM, ML         | A-4           | 0                           | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30           | NP-5                     |
| Wieland-----             | 0-5   | Gravelly loam----                                            | GC, CL, SC     | A-6           | 0-5                         | 60-85                                | 50-75  | 45-70  | 35-60 | 25-35           | 10-15                    |
|                          | 5-26  | Gravelly clay, clay.                                         | CH, SC         | A-7           | 0-5                         | 75-95                                | 55-90  | 50-80  | 45-75 | 50-60           | 25-35                    |
|                          | 26-52 | Gravelly sandy clay loam, gravelly clay loam.                | GC, SC         | A-6, A-2      | 0-5                         | 60-85                                | 50-70  | 40-70  | 25-50 | 35-40           | 15-20                    |
|                          | 52-60 | Loam, gravelly loam, gravelly sandy loam.                    | CL-ML, SM-SC   | A-4, A-2      | 0-5                         | 65-95                                | 55-90  | 40-85  | 25-70 | 20-30           | 5-10                     |
| Chiara-----              | 0-5   | Fine sandy loam                                              | SM             | A-4           | 0                           | 95-100                               | 90-100 | 65-75  | 40-50 | ---             | NP                       |
|                          | 5-16  | Very fine sandy loam, loam, silt loam.                       | ML             | A-4           | 0                           | 95-100                               | 90-100 | 80-95  | 70-80 | 25-35           | NP-5                     |
|                          | 16-20 | Indurated-----                                               | ---            | ---           | ---                         | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| 707*:<br>Orovada-----    | 0-8   | Fine sandy loam                                              | SM             | A-2, A-4      | 0                           | 95-100                               | 90-100 | 75-95  | 30-50 | ---             | NP                       |
|                          | 8-20  | Fine sandy loam, loam.                                       | SM, ML         | A-4           | 0                           | 75-100                               | 75-95  | 60-80  | 40-60 | 20-30           | NP-5                     |
|                          | 20-60 | Stratified fine sandy loam to silt loam.                     | SM, ML         | A-4           | 0                           | 75-100                               | 75-95  | 60-85  | 35-55 | 20-30           | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                         | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|----------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|------------------------|--------------------------|
|                          |       |                                                                      | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                        |                          |
|                          | In    |                                                                      |                |          | Pct                             |                                      |        |        |        |                        |                          |
| 707*:<br>Goldrun-----    | 0-7   | Fine sand-----                                                       | SM             | A-2      | 0                               | 100                                  | 100    | 75-90  | 15-35  | ---                    | NP                       |
|                          | 7-60  | Fine sand-----                                                       | SM             | A-2      | 0                               | 100                                  | 100    | 75-90  | 10-20  | ---                    | NP                       |
| 708*:<br>Orovada-----    | 0-8   | Fine sandy loam                                                      | SM             | A-2, A-4 | 0                               | 95-100                               | 90-100 | 75-95  | 30-50  | ---                    | NP                       |
|                          | 8-20  | Fine sandy loam,<br>loam.                                            | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-80  | 40-60  | 20-30                  | NP-5                     |
|                          | 20-60 | Stratified fine<br>sandy loam to<br>silt loam.                       | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-85  | 35-55  | 20-30                  | NP-5                     |
| Reina-----               | 0-7   | Loam-----                                                            | CL-ML, ML      | A-4      | 0                               | 90-100                               | 85-100 | 80-90  | 60-70  | 25-35                  | 5-10                     |
|                          | 7-18  | Very gravelly<br>clay, very<br>gravelly clay<br>loam.                | GC, GM         | A-2, A-7 | 10-25                           | 40-60                                | 35-55  | 30-55  | 25-50  | 40-60                  | 15-25                    |
|                          | 18-26 | Indurated-----                                                       | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
|                          | 26-30 | Unweathered<br>bedrock.                                              | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
| Rock outcrop.            |       |                                                                      |                |          |                                 |                                      |        |        |        |                        |                          |
| 709*:<br>Orovada-----    | 0-8   | Fine sandy loam                                                      | SM             | A-2, A-4 | 0                               | 95-100                               | 90-100 | 75-95  | 30-50  | ---                    | NP                       |
|                          | 8-20  | Fine sandy loam,<br>loam.                                            | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-80  | 40-60  | 20-30                  | NP-5                     |
|                          | 20-60 | Stratified fine<br>sandy loam to<br>silt loam.                       | SM, ML         | A-4      | 0                               | 75-100                               | 75-95  | 60-85  | 35-55  | 20-30                  | NP-5                     |
| Sodhouse-----            | 0-10  | Stony very fine<br>sandy loam.                                       | ML, GM, SM     | A-4      | 5-15                            | 65-100                               | 60-90  | 55-75  | 40-55  | 15-25                  | NP-5                     |
|                          | 10-17 | Fine sandy loam,<br>very fine sandy<br>loam, loam.                   | ML, SM         | A-4      | 0                               | 80-100                               | 75-90  | 65-85  | 35-55  | 15-25                  | NP-5                     |
|                          | 17-29 | Indurated-----                                                       | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
|                          | 29-60 | Extremely<br>gravelly sandy<br>loam, very<br>gravelly loamy<br>sand. | GM, GP-GM      | A-1      | 5-20                            | 25-60                                | 15-50  | 10-40  | 5-25   | ---                    | NP                       |
| 711-----<br>Paranat      | 0-20  | Silty clay loam                                                      | ML             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 90-100 | 35-45                  | 10-15                    |
|                          | 20-48 | Stratified silt<br>loam to silty<br>clay loam.                       | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 90-100 | 30-40                  | 5-15                     |
|                          | 48-60 | Stratified very<br>fine sandy loam<br>to silty clay.                 | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 85-95  | 75-90  | 30-40                  | 5-15                     |
| 713-----<br>Paranat      | 0-20  | Silty clay loam                                                      | ML             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 90-100 | 35-45                  | 10-15                    |
|                          | 20-60 | Silty clay loam,<br>silt loam.                                       | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 90-100 | 30-40                  | 5-15                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                 | Classification |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------------|----------------|------------------|---------------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
|                             |       |                                                                              | Unified        | AASHTO           |                                 | 4                                    | 10     | 40     | 200    |                 |                          |
|                             | In    |                                                                              |                |                  | Pct                             |                                      |        |        |        | Pct             |                          |
| 714-----<br>Paranat         | 0-20  | Silty clay loam                                                              | ML             | A-6, A-7         | 0                               | 100                                  | 100    | 95-100 | 90-100 | 35-45           | 10-15                    |
|                             | 20-48 | Stratified silt<br>loam to silty<br>clay loam.                               | ML             | A-4, A-6         | 0                               | 100                                  | 100    | 95-100 | 90-100 | 30-40           | 5-15                     |
|                             | 48-60 | Stratified very<br>fine sandy loam<br>to silty clay.                         | ML             | A-4, A-6         | 0                               | 100                                  | 100    | 85-95  | 75-90  | 30-40           | 5-15                     |
| 731-----<br>Yipor           | 0-8   | Silt loam-----                                                               | ML             | A-4              | 0                               | 100                                  | 100    | 95-100 | 85-100 | 20-30           | NP-5                     |
|                             | 8-60  | Silt loam, very<br>fine sandy loam.                                          | ML             | A-4              | 0                               | 100                                  | 100    | 95-100 | 75-100 | 20-30           | NP-5                     |
| 740*.<br>Playas             |       |                                                                              |                |                  |                                 |                                      |        |        |        |                 |                          |
| 770-----<br>Prida           | 0-7   | Silt loam-----                                                               | ML, CL-ML      | A-4              | 0                               | 95-100                               | 95-100 | 95-100 | 70-80  | 15-25           | NP-10                    |
|                             | 7-60  | Silt loam, silty<br>clay loam.                                               | ML             | A-6, A-4,<br>A-7 | 0                               | 95-100                               | 95-100 | 95-100 | 75-90  | 30-45           | 5-15                     |
| 774*:<br>Prida-----         | 0-5   | Silty clay loam                                                              | CL             | A-6              | 0                               | 95-100                               | 95-100 | 95-100 | 80-95  | 35-40           | 15-20                    |
|                             | 5-62  | Silt loam, silty<br>clay loam.                                               | ML             | A-6, A-4,<br>A-7 | 0                               | 95-100                               | 95-100 | 95-100 | 75-90  | 30-45           | 5-15                     |
| Sonoma-----                 | 0-8   | Silty clay loam                                                              | CL             | A-6, A-7         | 0                               | 100                                  | 100    | 95-100 | 80-95  | 35-50           | 15-25                    |
|                             | 8-60  | Silty clay loam,<br>silt loam.                                               | CL             | A-6, A-7         | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-50           | 15-25                    |
| 780-----<br>Pumper          | 0-12  | Silt loam-----                                                               | ML             | A-4              | 0                               | 95-100                               | 85-100 | 75-85  | 60-70  | 20-30           | NP-5                     |
|                             | 12-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sand. | GP, GP-GM      | A-1              | 0-5                             | 20-40                                | 20-35  | 10-20  | 0-10   | ---             | NP                       |
| 800-----<br>Raglan          | 0-8   | Silt loam-----                                                               | ML             | A-4              | 0                               | 95-100                               | 95-100 | 85-95  | 75-85  | 30-40           | 5-10                     |
|                             | 8-47  | Stratified silt<br>loam to fine<br>sandy loam.                               | ML             | A-6              | 0                               | 95-100                               | 95-100 | 80-90  | 60-70  | 35-40           | 10-15                    |
|                             | 47-60 | Stratified<br>gravelly loamy<br>sand to very<br>gravelly coarse<br>sand.     | SP-SM, SM      | A-1              | 0                               | 60-70                                | 40-60  | 25-35  | 5-15   | ---             | NP                       |
| 804-----<br>Raglan          | 0-8   | Silty clay loam                                                              | CL             | A-7              | 0                               | 100                                  | 95-100 | 90-100 | 85-95  | 40-50           | 15-25                    |
|                             | 8-47  | Stratified silt<br>loam to fine<br>sandy loam.                               | ML             | A-6              | 0                               | 95-100                               | 95-100 | 80-90  | 60-70  | 35-40           | 10-15                    |
|                             | 47-60 | Stratified<br>gravelly loamy<br>sand to very<br>gravelly coarse<br>sand.     | SP-SM, SM      | A-1              | 0                               | 60-70                                | 40-60  | 25-35  | 5-15   | ---             | NP                       |
| 805-----<br>Raglan          | 0-6   | Silt loam-----                                                               | CL-ML, ML      | A-4              | 0                               | 95-100                               | 95-100 | 85-95  | 75-85  | 25-35           | 5-10                     |
|                             | 6-14  | Silt loam-----                                                               | CL-ML, CL      | A-4, A-6         | 0                               | 95-100                               | 95-100 | 85-95  | 75-85  | 25-40           | 5-15                     |
|                             | 14-64 | Stratified very<br>fine sandy loam<br>to silty clay<br>loam.                 | CL, ML         | A-4, A-6         | 0                               | 95-100                               | 95-100 | 85-95  | 60-80  | 30-40           | 5-15                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                          | Classification |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------|----------------|---------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                       | Unified        | AASHTO        |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                       |                |               | Pct                             |                                      |       |       |       | Pct             |                          |
| 814*:<br>Quarz-----         | 0-7   | Very gravelly loam.                                                                   | GC             | A-2           | 0-15                            | 40-55                                | 35-50 | 30-45 | 20-35 | 25-35           | 10-15                    |
|                             | 7-26  | Very gravelly clay, very gravelly clay loam.                                          | GC             | A-2, A-7      | 0-25                            | 30-55                                | 25-50 | 20-45 | 15-40 | 45-60           | 20-30                    |
|                             | 26-30 | Unweathered bedrock.                                                                  | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Linrose-----                | 0-8   | Very gravelly loam.                                                                   | GM             | A-2, A-4, A-1 | 0-15                            | 40-50                                | 35-50 | 30-45 | 20-40 | 15-25           | NP-5                     |
|                             | 8-26  | Very gravelly loam, very gravelly sandy loam.                                         | GC, GM-GC      | A-2           | 0-15                            | 40-60                                | 30-50 | 25-45 | 15-35 | 25-35           | 5-15                     |
|                             | 26    | Unweathered bedrock.                                                                  | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Slaven-----                 | 0-5   | Extremely gravelly loam.                                                              | GC             | A-2           | 10-20                           | 30-45                                | 15-25 | 15-25 | 10-20 | 25-35           | 10-15                    |
|                             | 5-22  | Extremely gravelly clay, extremely gravelly sandy clay, extremely gravelly clay loam. | GC             | A-2           | 0                               | 25-35                                | 15-25 | 15-20 | 10-20 | 40-50           | 15-25                    |
|                             | 22    | Unweathered bedrock.                                                                  | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 816*:<br>Quarz-----         | 0-7   | Cobbly loam-----                                                                      | CL             | A-6           | 25-30                           | 85-95                                | 80-90 | 60-70 | 50-60 | 25-35           | 10-15                    |
|                             | 7-26  | Very gravelly clay, very gravelly clay loam.                                          | GC             | A-2, A-7      | 0-25                            | 30-55                                | 25-50 | 20-45 | 15-40 | 45-60           | 20-30                    |
|                             | 26-30 | Unweathered bedrock.                                                                  | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Linrose-----                | 0-8   | Very cobbly loam                                                                      | GM, SM         | A-4, A-2      | 30-45                           | 55-75                                | 50-70 | 45-65 | 30-45 | 15-25           | NP-5                     |
|                             | 8-26  | Very gravelly loam, very gravelly sandy loam.                                         | GC, GM-GC      | A-2           | 0-15                            | 40-60                                | 30-50 | 25-45 | 15-35 | 25-35           | 5-15                     |
|                             | 26    | Unweathered bedrock.                                                                  | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Cleavage-----               | 0-4   | Extremely cobbly loam.                                                                | GM-GC, GC      | A-2           | 45-55                           | 35-55                                | 30-45 | 25-40 | 20-35 | 25-35           | 5-15                     |
|                             | 4-15  | Very cobbly clay loam, extremely cobbly sandy clay loam, very gravelly clay loam.     | GC             | A-2           | 25-45                           | 40-55                                | 30-45 | 25-45 | 20-35 | 30-45           | 10-20                    |
|                             | 15-19 | Unweathered bedrock.                                                                  | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                   | Classification |           | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------|----------------|-----------|---------------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
|                             |       |                                                | Unified        | AASHTO    |                                 | 4                                    | 10     | 40     | 200    |                 |                          |
|                             | In    |                                                |                |           | Pct                             |                                      |        |        |        | Pct             |                          |
| 830-----<br>Reese           | 0-9   | Silt loam-----                                 | CL-ML          | A-4       | 0                               | 100                                  | 100    | 95-100 | 80-85  | 25-30           | 5-10                     |
|                             | 9-60  | Stratified silt<br>loam to silty<br>clay loam. | CL             | A-6       | 0                               | 100                                  | 90-100 | 75-90  | 70-85  | 25-35           | 10-15                    |
| 835*:<br>Reese-----         | 0-9   | Silt loam-----                                 | CL-ML          | A-4       | 0                               | 100                                  | 100    | 95-100 | 80-85  | 25-30           | 5-10                     |
|                             | 9-60  | Stratified silt<br>loam to silty<br>clay loam. | CL             | A-6       | 0                               | 100                                  | 90-100 | 75-90  | 70-85  | 25-35           | 10-15                    |
| Ocala-----                  | 0-6   | Silt loam-----                                 | ML, CL         | A-4, A-6  | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40           | 5-15                     |
|                             | 6-13  | Silt loam, silty<br>clay loam.                 | ML, CL         | A-6, A-7  | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-50           | 10-20                    |
|                             | 13-60 | Silt loam, silty<br>clay loam.                 | ML, CL         | A-6, A-7  | 0                               | 90-100                               | 90-100 | 90-95  | 85-90  | 30-50           | 10-20                    |
| 841-----<br>Wendane Variant | 0-10  | Silt loam-----                                 | CL-ML          | A-4       | 0                               | 100                                  | 100    | 85-95  | 65-80  | 25-30           | 5-10                     |
|                             | 10-18 | Gravelly silt<br>loam.                         | CL-ML, CL      | A-2, A-4, | 0                               | 55-75                                | 50-70  | 40-65  | 30-55  | 25-35           | 5-15                     |
|                             | 18-60 | Very gravelly<br>loam.                         | GM-GC, GC      | A-6       | 0                               | 45-60                                | 35-50  | 30-45  | 20-35  | 25-35           | 5-15                     |
| 850-----<br>Relley          | 0-8   | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 75-90  | 25-35           | 5-10                     |
|                             | 8-16  | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 16-28 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 28-63 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
| 851-----<br>Relley          | 0-8   | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 75-90  | 25-35           | 5-10                     |
|                             | 8-16  | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 16-28 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 28-50 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 50-60 | Cemented-----                                  | ---            | ---       | ---                             | ---                                  | ---    | ---    | ---    | ---             | ---                      |
| 852-----<br>Relley          | 0-8   | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 75-90  | 25-35           | 5-10                     |
|                             | 8-16  | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 16-28 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 28-60 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
| 853-----<br>Relley          | 0-8   | Silty clay loam                                | CL, ML         | A-6, A-7  | 0                               | 95-100                               | 95-100 | 95-100 | 85-100 | 35-45           | 10-20                    |
|                             | 8-16  | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 16-28 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 28-60 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
| 855*:<br>Relley-----        | 0-8   | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 75-90  | 25-35           | 5-10                     |
|                             | 8-16  | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 16-28 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
|                             | 28-60 | Silt loam-----                                 | CL-ML, ML      | A-4       | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35           | 5-10                     |
| Broyles-----                | 0-5   | Very fine sandy<br>loam.                       | SM, ML         | A-4       | 0                               | 90-100                               | 90-100 | 85-95  | 45-60  | ---             | NP                       |
|                             | 5-14  | Very fine sandy<br>loam.                       | SM, ML         | A-4       | 0                               | 90-100                               | 90-100 | 85-95  | 40-55  | ---             | NP                       |
|                             | 14-60 | Gravelly fine<br>sandy loam.                   | SM             | A-1, A-2  | 0                               | 70-85                                | 55-70  | 45-60  | 15-30  | ---             | NP                       |
| 861-----<br>Rixie           | 0-10  | Silty clay loam                                | ML, CL         | A-7       | 0                               | 100                                  | 100    | 95-100 | 90-95  | 40-50           | 15-20                    |
|                             | 10-60 | Stratified silt<br>loam to silty<br>clay.      | CL, ML         | A-6, A-7  | 0                               | 100                                  | 100    | 95-100 | 60-75  | 35-50           | 10-25                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                                       | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|----------------------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|-------|--------|-------|------------------------|--------------------------|
|                          |       |                                                                                                    | Unified         | AASHTO   |                                 | 4                                    | 10    | 40     | 200   |                        |                          |
|                          | In    |                                                                                                    |                 |          | Pct                             |                                      |       |        |       |                        |                          |
| 862-----<br>Rixie        | 0-10  | Silty clay loam                                                                                    | CL              | A-6, A-7 | 0                               | 100                                  | 100   | 95-100 | 90-95 | 35-45                  | 15-20                    |
|                          | 10-60 | Stratified silt<br>loam to silty<br>clay.                                                          | CL              | A-6, A-7 | 0                               | 100                                  | 100   | 95-100 | 75-85 | 35-45                  | 15-20                    |
| 863*:<br>Rixie-----      | 0-10  | Silty clay loam                                                                                    | ML, CL          | A-7      | 0                               | 100                                  | 100   | 95-100 | 90-95 | 40-50                  | 15-20                    |
|                          | 10-60 | Stratified silt<br>loam to silty<br>clay.                                                          | CL, ML          | A-6, A-7 | 0                               | 100                                  | 100   | 95-100 | 60-75 | 35-50                  | 10-25                    |
| Rixie, sodic----         | 0-15  | Silt loam-----                                                                                     | CL              | A-6      | 0                               | 100                                  | 100   | 95-100 | 90-95 | 30-40                  | 10-15                    |
|                          | 15-60 | Stratified silt<br>loam to silty<br>clay.                                                          | CL, ML          | A-6, A-7 | 0                               | 100                                  | 100   | 95-100 | 60-75 | 35-50                  | 10-25                    |
| 864-----<br>Rixie        | 0-10  | Silty clay loam                                                                                    | ML, CL          | A-7      | 0                               | 100                                  | 100   | 95-100 | 90-95 | 40-50                  | 15-20                    |
|                          | 10-43 | Stratified silt<br>loam to silty<br>clay.                                                          | CL, ML          | A-6, A-7 | 0                               | 100                                  | 100   | 95-100 | 60-75 | 35-50                  | 10-25                    |
|                          | 43-62 | Stratified very<br>gravelly sand to<br>fine sandy loam.                                            | SM              | A-1, A-2 | 0                               | 60-90                                | 35-70 | 20-65  | 10-35 | ---                    | NP                       |
| 870*:<br>Roca-----       | 0-5   | Very cobbly loam                                                                                   | CL              | A-6      | 50-60                           | 85-100                               | 75-85 | 70-80  | 50-60 | 25-35                  | 10-15                    |
|                          | 5-27  | Very gravelly<br>clay loam, very<br>gravelly clay.                                                 | GC, SC          | A-2      | 0-10                            | 60-75                                | 30-50 | 25-45  | 20-35 | 45-60                  | 20-30                    |
|                          | 27-31 | Unweathered<br>bedrock.                                                                            | ---             | ---      | ---                             | ---                                  | ---   | ---    | ---   | ---                    | ---                      |
| Bregar-----              | 0-4   | Gravelly loam----                                                                                  | GM-GC,<br>SM-SC | A-4      | 0                               | 60-80                                | 55-75 | 50-65  | 35-50 | 15-25                  | 5-10                     |
|                          | 4-11  | Very gravelly<br>clay loam,<br>extremely<br>gravelly loam,<br>extremely cobbly<br>sandy clay loam. | GC              | A-2      | 0-40                            | 25-45                                | 20-35 | 15-30  | 15-25 | 35-45                  | 15-25                    |
|                          | 11-15 | Unweathered<br>bedrock.                                                                            | ---             | ---      | ---                             | ---                                  | ---   | ---    | ---   | ---                    | ---                      |
| Linrose-----             | 0-8   | Gravelly loam----                                                                                  | ML, GM          | A-4      | 0-10                            | 65-85                                | 55-75 | 50-70  | 35-60 | 15-25                  | NP-5                     |
|                          | 8-26  | Very gravelly<br>loam, very<br>gravelly sandy<br>loam.                                             | GC, GM-GC       | A-2      | 0-15                            | 40-60                                | 30-50 | 25-45  | 15-35 | 25-35                  | 5-15                     |
|                          | 26    | Unweathered<br>bedrock.                                                                            | ---             | ---      | ---                             | ---                                  | ---   | ---    | ---   | ---                    | ---                      |
| 872*:<br>Roca-----       | 0-5   | Very gravelly<br>loam.                                                                             | GC              | A-2      | 0-10                            | 35-60                                | 30-50 | 25-40  | 20-35 | 25-35                  | 10-15                    |
|                          | 5-27  | Very gravelly<br>clay loam, very<br>gravelly clay.                                                 | GC, SC          | A-2      | 0-15                            | 60-75                                | 40-50 | 30-45  | 25-35 | 45-60                  | 25-35                    |
|                          | 27-31 | Unweathered<br>bedrock.                                                                            | ---             | ---      | ---                             | ---                                  | ---   | ---    | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                               | Classification |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|----------------------------------------------------------------------------|----------------|---------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                            | Unified        | AASHTO        |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                            |                |               | Pct                             |                                      |       |       |       | Pct             |                          |
| 872*:<br>Linrose-----       | 0-8   | Very gravelly loam.                                                        | GM             | A-2, A-4, A-1 | 0-15                            | 40-50                                | 35-50 | 30-45 | 20-40 | 15-25           | NP-5                     |
|                             | 8-26  | Very gravelly loam, very gravelly sandy loam.                              | GC, GM-GC      | A-2           | 0-15                            | 40-60                                | 30-50 | 25-45 | 15-35 | 25-35           | 5-15                     |
|                             | 26    | Unweathered bedrock.                                                       | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Wiskan-----                 | 0-16  | Very gravelly loam.                                                        | GM, GM-GC      | A-1, A-2, A-4 | 0-15                            | 40-60                                | 30-50 | 25-50 | 20-40 | 20-30           | NP-10                    |
|                             | 16-28 | Very gravelly clay loam, very gravelly loam, extremely gravelly clay loam. | GC             | A-2           | 10-25                           | 40-55                                | 30-45 | 25-45 | 20-35 | 30-40           | 10-20                    |
|                             | 28    | Unweathered bedrock.                                                       | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 873*:<br>Roca-----          | 0-5   | Very cobbly loam                                                           | CL             | A-6           | 50-60                           | 85-100                               | 75-85 | 70-80 | 50-60 | 25-35           | 10-15                    |
|                             | 5-27  | Very gravelly clay loam, very gravelly clay.                               | GC, SC         | A-2           | 0-10                            | 60-75                                | 30-50 | 25-45 | 20-35 | 45-60           | 20-30                    |
|                             | 27-31 | Unweathered bedrock.                                                       | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Reluctan-----               | 0-13  | Very cobbly loam                                                           | GM-GC          | A-2, A-4      | 30-50                           | 55-65                                | 45-60 | 40-55 | 30-45 | 25-30           | 5-10                     |
|                             | 13-38 | Gravelly loam, gravelly clay loam.                                         | GC, CL         | A-6, A-7      | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45           | 15-20                    |
|                             | 38-42 | Unweathered bedrock.                                                       | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 875*:<br>Roca-----          | 0-5   | Very cobbly loam                                                           | CL             | A-6           | 50-60                           | 85-100                               | 75-85 | 70-80 | 50-60 | 25-35           | 10-15                    |
|                             | 5-27  | Very gravelly clay loam, very gravelly clay.                               | GC, SC         | A-2           | 0-10                            | 60-75                                | 30-50 | 25-45 | 20-35 | 45-60           | 20-30                    |
|                             | 27-31 | Unweathered bedrock.                                                       | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Glean-----                  | 0-6   | Gravelly silt loam.                                                        | GM, SM, ML     | A-4           | 0-10                            | 55-80                                | 50-75 | 45-65 | 40-55 | 20-30           | NP-5                     |
|                             | 6-49  | Very gravelly sandy loam, very gravelly loam.                              | GM             | A-1, A-2      | 0-25                            | 30-65                                | 25-60 | 20-50 | 10-35 | 20-30           | NP-5                     |
|                             | 49-53 | Unweathered bedrock.                                                       | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                       | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|----------------------------------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|------------------------|--------------------------|
|                             |       |                                                                                                    | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                        |                          |
|                             | In    |                                                                                                    |                |          | Pct                             |                                      |        |        |        |                        |                          |
| 875*:<br>Bregar-----        | 0-4   | Extremely<br>gravelly loam.                                                                        | GM-GC, GC      | A-2      | 10-20                           | 35-50                                | 20-30  | 15-25  | 10-20  | 25-35                  | 5-15                     |
|                             | 4-11  | Very gravelly<br>sandy clay loam,<br>extremely cobbly<br>clay loam, very<br>gravelly clay<br>loam. | GC             | A-2      | 5-45                            | 40-50                                | 25-35  | 20-30  | 10-25  | 35-45                  | 15-25                    |
|                             | 11-15 | Unweathered<br>bedrock.                                                                            | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
| 881-----<br>Rose Creek      | 0-10  | Silt loam-----                                                                                     | ML             | A-4      | 0                               | 100                                  | 100    | 75-90  | 60-75  | 20-30                  | NP-5                     |
|                             | 10-60 | Stratified very<br>fine sandy loam<br>to gravelly<br>sand.                                         | SM             | A-4      | 0                               | 90-100                               | 85-95  | 70-85  | 35-50  | 15-25                  | NP-5                     |
| 882-----<br>Rose Creek      | 0-10  | Silty clay loam                                                                                    | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 15-25                    |
|                             | 10-60 | Stratified<br>gravelly sand to<br>silt loam.                                                       | SM             | A-2, A-4 | 0                               | 85-100                               | 70-95  | 50-70  | 30-50  | 20-25                  | NP-5                     |
| 883*:<br>Rose Creek-----    | 0-10  | Silty clay loam                                                                                    | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 15-25                    |
|                             | 10-60 | Stratified<br>gravelly sand to<br>silt loam.                                                       | SM             | A-2, A-4 | 0                               | 85-100                               | 70-95  | 50-70  | 30-50  | 20-25                  | NP-5                     |
| Paranat-----                | 0-20  | Silty clay loam                                                                                    | ML             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 90-100 | 35-45                  | 10-15                    |
|                             | 20-48 | Stratified silt<br>loam to silty<br>clay loam.                                                     | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 90-100 | 30-40                  | 5-15                     |
|                             | 48-60 | Stratified very<br>fine sandy loam<br>to silty clay.                                               | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 85-95  | 75-90  | 30-40                  | 5-15                     |
| 891-----<br>Rosney          | 0-9   | Loam-----                                                                                          | CL-ML, CL      | A-4      | 0                               | 100                                  | 100    | 85-95  | 60-75  | 25-30                  | 5-10                     |
|                             | 9-50  | Silty clay loam,<br>silt loam.                                                                     | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-90  | 30-45                  | 10-20                    |
|                             | 50-60 | Cemented-----                                                                                      | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
| 892-----<br>Rosney          | 0-7   | Silt loam-----                                                                                     | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90  | 20-25                  | NP-5                     |
|                             | 7-25  | Silt loam-----                                                                                     | CL-ML          | A-4      | 0                               | 100                                  | 100    | 95-100 | 80-95  | 20-30                  | 5-10                     |
|                             | 25-60 | Stratified silt<br>loam to silty<br>clay.                                                          | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 15-20                    |
| 970, 971-----<br>Soolake    | 0-13  | Very fine sandy<br>loam.                                                                           | ML             | A-4      | 0                               | 100                                  | 100    | 85-95  | 65-80  | 15-25                  | NP-5                     |
|                             | 13-22 | Fine sandy loam,<br>very fine sandy<br>loam.                                                       | SM             | A-4      | 0                               | 100                                  | 100    | 75-90  | 40-50  | 15-25                  | NP-5                     |
|                             | 22-60 | Stratified loamy<br>fine sand to<br>sand.                                                          | SM             | A-2      | 0                               | 100                                  | 85-100 | 65-75  | 20-30  | ---                    | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                             | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
|                          |       |                                          | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                 |                          |
|                          | In    |                                          |                |          | Pct                             |                                      |        |        |        | Pct             |                          |
| 972*:<br>Soolake-----    | 0-13  | Very fine sandy loam.                    | ML             | A-4      | 0                               | 100                                  | 100    | 85-95  | 65-80  | 15-25           | NP-5                     |
|                          | 13-22 | Fine sandy loam, very fine sandy loam.   | SM             | A-4      | 0                               | 100                                  | 100    | 75-90  | 40-50  | 15-25           | NP-5                     |
|                          | 22-60 | Stratified loamy fine sand to sand.      | SM             | A-2      | 0                               | 100                                  | 85-100 | 65-75  | 20-30  | ---             | NP                       |
| Dunphy-----              | 0-6   | Very fine sandy loam.                    | ML             | A-4      | 0                               | 100                                  | 100    | 85-100 | 50-65  | 20-25           | NP-5                     |
|                          | 6-54  | Very fine sandy loam, fine sandy loam.   | ML             | A-4      | 0                               | 100                                  | 100    | 80-95  | 50-65  | 20-25           | NP-5                     |
|                          | 54-60 | Cemented-----                            | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---             | ---                      |
| Argenta-----             | 0-7   | Fine sandy loam                          | SM, ML         | A-4      | 0                               | 100                                  | 100    | 70-85  | 40-55  | ---             | NP                       |
|                          | 7-45  | Stratified fine sandy loam to silt loam. | ML             | A-4      | 0                               | 100                                  | 90-100 | 80-95  | 50-65  | ---             | NP                       |
|                          | 45-60 | Gravelly sandy loam.                     | SM             | A-1, A-2 | 0                               | 95-100                               | 55-65  | 35-45  | 20-30  | 15-25           | NP-5                     |
| 980-----<br>Sombrero     | 0-4   | Very fine sandy loam.                    | ML             | A-4      | 0                               | 100                                  | 100    | 90-100 | 55-65  | 15-25           | NP-5                     |
|                          | 4-16  | Silt loam, silty clay loam.              | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 80-90  | 30-40           | 10-20                    |
|                          | 16-42 | Cemented-----                            | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---             | ---                      |
|                          | 42-60 | Stratified loam to gravelly sand.        | SM, ML, GM     | A-2, A-4 | 0                               | 60-95                                | 55-90  | 45-70  | 30-55  | 15-25           | NP-5                     |
| 990-----<br>Sonoma       | 0-8   | Silt loam-----                           | CL             | A-6      | 0                               | 100                                  | 100    | 100    | 95-100 | 30-35           | 10-15                    |
|                          | 8-60  | Stratified silt loam to silty clay loam. | ML, CL         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50           | 10-25                    |
| 991-----<br>Sonoma       | 0-8   | Silt loam-----                           | ML             | A-4      | 0                               | 100                                  | 100    | 100    | 95-100 | 30-35           | 5-10                     |
|                          | 8-60  | Stratified silt loam to silty clay loam. | ML, CL         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50           | 10-25                    |
| 992-----<br>Sonoma       | 0-8   | Silt loam-----                           | CL             | A-6      | 0                               | 100                                  | 100    | 100    | 95-100 | 30-35           | 10-15                    |
|                          | 8-60  | Stratified silt loam to silty clay loam. | ML, CL         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50           | 10-25                    |
| 993-----<br>Sonoma       | 0-8   | Silty clay loam                          | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-95  | 35-50           | 15-25                    |
|                          | 8-65  | Stratified silt loam to silty clay loam. | CL, ML         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50           | 10-25                    |
| 994-----<br>Sonoma       | 0-8   | Silty clay loam                          | ML, CL         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50           | 10-25                    |
|                          | 8-60  | Stratified silt loam to silty clay loam. | ML, CL         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50           | 10-25                    |
| 995-----<br>Sonoma       | 0-8   | Silty clay loam                          | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-95  | 35-50           | 15-25                    |
|                          | 8-60  | Silty clay loam, silt loam.              | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-50           | 15-25                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol                 | Depth | USDA texture                                                                          | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|------------------------------------------|-------|---------------------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|------------------------|--------------------------|
|                                          |       |                                                                                       | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                        |                          |
|                                          | In    |                                                                                       |                |          | Pct                             |                                      |        |        |        |                        |                          |
| 996*:<br>Sonoma, strongly<br>saline----- | 0-12  | Silty clay loam                                                                       | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-95  | 35-50                  | 15-25                    |
|                                          | 12-60 | Silty clay loam,<br>silt loam.                                                        | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-50                  | 15-25                    |
| Sonoma-----                              | 0-12  | Silty clay-----                                                                       | MH             | A-7      | 0                               | 100                                  | 100    | 95-100 | 90-100 | 55-65                  | 20-25                    |
|                                          | 12-60 | Stratified silt<br>loam to silty<br>clay loam.                                        | CL, ML         | A-6, A-7 | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50                  | 10-25                    |
| 997-----<br>Sonoma                       | 0-8   | Silty clay loam                                                                       | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 80-95  | 35-50                  | 15-25                    |
|                                          | 8-60  | Silty clay loam,<br>silt loam.                                                        | CL             | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-50                  | 15-25                    |
| 1021*:<br>Susie Creek----                | 0-9   | Silt loam-----                                                                        | CL-ML, ML      | A-4      | 0                               | 90-100                               | 85-95  | 80-95  | 70-80  | 25-35                  | 5-10                     |
|                                          | 9-27  | Clay loam, silty<br>clay, clay.                                                       | CL, CH         | A-7      | 0                               | 90-100                               | 85-95  | 80-95  | 65-90  | 40-55                  | 20-30                    |
|                                          | 27-42 | Sandy loam, loam                                                                      | SM, ML         | A-4      | 0                               | 85-100                               | 75-95  | 60-80  | 45-65  | 20-25                  | NP-5                     |
|                                          | 42    | Unweathered<br>bedrock.                                                               | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
| Millerlux-----                           | 0-10  | Very cobbly loam                                                                      | GC, GM-GC      | A-6, A-4 | 25-50                           | 55-70                                | 50-65  | 40-55  | 35-50  | 25-35                  | 5-15                     |
|                                          | 10-15 | Clay-----                                                                             | CH             | A-7      | 0-10                            | 90-100                               | 85-100 | 80-95  | 60-75  | 50-65                  | 25-40                    |
|                                          | 15-19 | Unweathered<br>bedrock.                                                               | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
| 1031-----<br>Teman                       | 0-8   | Silt loam-----                                                                        | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 70-90  | 30-40                  | 5-15                     |
|                                          | 8-63  | Silt loam, silty<br>clay loam.                                                        | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40                  | 5-15                     |
| 1032-----<br>Teman                       | 0-8   | Silt loam-----                                                                        | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 70-90  | 30-40                  | 5-15                     |
|                                          | 8-40  | Silt loam, silty<br>clay loam.                                                        | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40                  | 5-15                     |
|                                          | 40-60 | Silty clay-----                                                                       | MH             | A-7      | 0                               | 100                                  | 100    | 95-100 | 90-100 | 50-65                  | 15-25                    |
| 1033-----<br>Teman                       | 0-8   | Silt loam-----                                                                        | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 70-90  | 30-40                  | 5-15                     |
|                                          | 8-60  | Silt loam, silty<br>clay loam.                                                        | ML             | A-4, A-6 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40                  | 5-15                     |
| 1040*:<br>Tenabo, gravelly               | 0-6   | Gravelly very<br>fine sandy loam.                                                     | SM, GM         | A-2, A-4 | 0-5                             | 60-70                                | 50-60  | 45-55  | 25-40  | ---                    | NP                       |
|                                          | 6-18  | Silty clay loam,<br>clay loam,<br>gravelly clay<br>loam.                              | CL             | A-6      | 0                               | 95-100                               | 70-90  | 60-90  | 50-80  | 30-40                  | 10-20                    |
|                                          | 18-40 | Indurated-----                                                                        | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
|                                          | 40-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly coarse<br>sand. | GP-GM, GM      | A-1      | 5-25                            | 40-60                                | 35-55  | 25-35  | 5-20   | ---                    | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                      | Classification      |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------------------|---------------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                                   | Unified             | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                             | In    |                                                                                                   |                     |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 1040*:<br>Allor-----        | 0-12  | Very cobbly loam                                                                                  | SM-SC,<br>GM-GC     | A-2, A-4 | 30-50                           | 60-75                                | 45-70  | 40-65 | 30-45 | 20-30           | 5-10                     |
|                             | 12-34 | Gravelly clay<br>loam, gravelly<br>sandy clay loam.                                               | SC                  | A-6, A-7 | 0-10                            | 70-85                                | 55-75  | 45-65 | 35-50 | 35-45           | 15-20                    |
|                             | 34-60 | Gravelly loamy<br>sand, very<br>gravelly loamy<br>sand.                                           | SM                  | A-1      | 0-10                            | 55-75                                | 45-65  | 30-50 | 10-20 | ---             | NP                       |
| Tenabo-----                 | 0-6   | Very cobbly loam                                                                                  | SM-SC, SM           | A-4      | 30-50                           | 75-90                                | 60-75  | 50-70 | 35-50 | 15-25           | NP-10                    |
|                             | 6-18  | Clay loam, sandy<br>clay loam.                                                                    | CL                  | A-6      | 0                               | 90-100                               | 85-95  | 70-85 | 50-65 | 30-40           | 15-25                    |
|                             | 18-40 | Indurated-----                                                                                    | ---                 | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                             | 40-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly coarse<br>sand.             | GW-GM, GM,<br>GP-GM | A-1      | 10-25                           | 40-60                                | 35-55  | 25-40 | 5-20  | ---             | NP                       |
| 1041*:<br>Tenabo-----       | 0-13  | Silt loam-----                                                                                    | ML                  | A-4      | 0                               | 95-100                               | 90-100 | 85-95 | 75-85 | 25-35           | NP-10                    |
|                             | 13-20 | Clay loam, silty<br>clay loam,<br>gravelly clay<br>loam.                                          | CL                  | A-6      | 0                               | 95-100                               | 70-95  | 60-90 | 50-85 | 30-40           | 15-25                    |
|                             | 20-39 | Indurated-----                                                                                    | ---                 | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                             | 39-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly coarse<br>sand.             | GP-GM, GM           | A-1      | 5-25                            | 40-60                                | 35-55  | 25-35 | 5-20  | ---             | NP                       |
| Ricert-----                 | 0-6   | Gravelly silt<br>loam.                                                                            | SM-SC               | A-4      | 0                               | 75-85                                | 55-75  | 40-55 | 35-50 | 20-30           | 5-10                     |
|                             | 6-18  | Loam, clay loam                                                                                   | CL                  | A-6, A-7 | 0                               | 90-100                               | 85-100 | 80-90 | 70-80 | 35-45           | 15-20                    |
|                             | 18-60 | Very gravelly<br>sandy loam, very<br>gravelly loamy<br>sand, extremely<br>gravelly loamy<br>sand. | GM, GP-GM           | A-1      | 0-15                            | 30-60                                | 20-50  | 15-35 | 5-25  | ---             | NP                       |
| 1042-----<br>Tenabo         | 0-6   | Very gravelly<br>loam.                                                                            | GM                  | A-1, A-2 | 5-10                            | 40-55                                | 35-50  | 25-45 | 20-30 | 15-25           | NP-5                     |
|                             | 6-18  | Silty clay loam,<br>clay loam,<br>gravelly clay<br>loam.                                          | CL                  | A-6      | 0                               | 95-100                               | 70-90  | 60-90 | 50-80 | 30-40           | 10-20                    |
|                             | 18-40 | Indurated-----                                                                                    | ---                 | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                             | 40-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly coarse<br>sand.             | GP-GM, GM           | A-1      | 5-25                            | 40-60                                | 35-55  | 25-35 | 5-20  | ---             | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                              | Classification             |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------|----------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                           | Unified                    | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                             | In    |                                                                                           |                            |          | Pct                             |                                      |       |       |       | Pct                    |                          |
| 1062*:<br>Tomera-----       | 0-8   | Gravelly loam----                                                                         | SM, GM,<br>SM-SC,<br>GM-GC | A-2, A-4 | 0                               | 55-80                                | 50-75 | 35-70 | 25-50 | 20-30                  | NP-10                    |
|                             | 8-33  | Gravelly clay,<br>clay, gravelly<br>sandy clay.                                           | CH, SC                     | A-7      | 0                               | 70-85                                | 55-80 | 45-75 | 35-60 | 50-65                  | 25-35                    |
|                             | 33-60 | Extremely<br>gravelly sandy<br>loam, very<br>gravelly loamy<br>sand, very<br>cobbly loam. | GM                         | A-1      | 1-40                            | 40-50                                | 30-45 | 20-40 | 10-25 | ---                    | NP                       |
| Snapp-----                  | 0-10  | Gravelly very<br>fine sandy loam.                                                         | GM, SM                     | A-2      | 0                               | 55-80                                | 50-75 | 45-70 | 25-35 | 20-25                  | NP-5                     |
|                             | 10-30 | Gravelly clay,<br>gravelly clay<br>loam, clay.                                            | CH, GC                     | A-7      | 0                               | 55-100                               | 50-90 | 45-85 | 35-70 | 50-75                  | 30-50                    |
|                             | 30-60 | Extremely<br>gravelly loamy<br>sand, very<br>gravelly loamy<br>sand.                      | GP-GM, GM,<br>SP-SM, SM    | A-1      | 0                               | 25-60                                | 15-50 | 10-40 | 5-15  | ---                    | NP                       |
| Whirlo-----                 | 0-7   | Gravelly sandy<br>loam.                                                                   | SM                         | A-2, A-4 | 0-10                            | 65-80                                | 60-75 | 40-55 | 25-40 | 15-25                  | NP-5                     |
|                             | 7-13  | Gravelly sandy<br>loam, gravelly<br>loam, fine sandy<br>loam.                             | SM, GM                     | A-2, A-4 | 0-10                            | 60-95                                | 55-85 | 40-60 | 25-50 | 15-25                  | NP-5                     |
|                             | 13-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam.        | GM                         | A-1, A-2 | 5-30                            | 45-60                                | 25-50 | 20-40 | 10-30 | 15-25                  | NP-5                     |
| 1080*:<br>Trunk-----        | 0-5   | Very cobbly loam                                                                          | GM-GC,<br>SM-SC,<br>SC, GC | A-4, A-6 | 30-45                           | 55-80                                | 50-75 | 45-70 | 35-50 | 25-35                  | 5-15                     |
|                             | 5-28  | Gravelly clay,<br>gravelly clay<br>loam.                                                  | CL, GC, CH                 | A-7      | 0-10                            | 55-85                                | 50-80 | 45-75 | 40-65 | 40-55                  | 20-30                    |
|                             | 28-32 | Unweathered<br>bedrock.                                                                   | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Burrita-----                | 0-3   | Very cobbly loam                                                                          | GM-GC                      | A-4      | 25-40                           | 60-70                                | 55-65 | 50-60 | 35-45 | 15-25                  | 5-10                     |
|                             | 3-18  | Very cobbly clay,<br>very stony clay<br>loam, very<br>gravelly clay<br>loam.              | GC, SC                     | A-2, A-7 | 10-55                           | 35-75                                | 30-55 | 25-50 | 20-45 | 40-55                  | 20-30                    |
|                             | 18-22 | Unweathered<br>bedrock.                                                                   | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                 | Classification             |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------------------------------------------|----------------------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                              | Unified                    | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                          | In    |                                                                              |                            |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 1082*:<br>Trunk-----     | 0-5   | Loam-----                                                                    | CL-ML, ML                  | A-4      | 0                               | 85-100                               | 80-100 | 70-90 | 55-70 | 20-30           | NP-10                    |
|                          | 5-28  | Gravelly clay,<br>gravelly clay<br>loam.                                     | CL, CH, GC                 | A-7      | 0-10                            | 55-85                                | 50-80  | 45-75 | 40-65 | 40-55           | 20-30                    |
|                          | 28-32 | Unweathered<br>bedrock.                                                      | ---                        | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Reina-----               | 0-7   | Loam-----                                                                    | CL-ML, ML                  | A-4      | 0                               | 90-100                               | 85-100 | 80-90 | 60-70 | 25-35           | 5-10                     |
|                          | 7-18  | Very gravelly<br>clay, very<br>gravelly clay<br>loam.                        | GC, GM                     | A-2, A-7 | 10-25                           | 40-60                                | 35-55  | 30-55 | 25-50 | 40-60           | 15-25                    |
|                          | 18-26 | Indurated-----                                                               | ---                        | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                          | 26-30 | Unweathered<br>bedrock.                                                      | ---                        | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 1084*:<br>Trunk-----     | 0-5   | Cobbly loam-----                                                             | CL-ML, ML                  | A-4      | 15-30                           | 75-95                                | 70-90  | 60-90 | 50-70 | 20-30           | NP-10                    |
|                          | 5-28  | Gravelly clay,<br>gravelly clay<br>loam.                                     | CL, CH, GC                 | A-7      | 0-10                            | 55-85                                | 50-80  | 45-75 | 40-65 | 40-55           | 20-30                    |
|                          | 28-32 | Unweathered<br>bedrock.                                                      | ---                        | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Burrita-----             | 0-3   | Very cobbly loam                                                             | GM-GC                      | A-4      | 25-40                           | 60-70                                | 55-65  | 50-60 | 35-45 | 15-25           | 5-10                     |
|                          | 3-18  | Very cobbly clay,<br>very stony clay<br>loam, very<br>gravelly clay<br>loam. | GC, SC                     | A-2, A-7 | 10-55                           | 35-75                                | 30-55  | 25-50 | 20-45 | 40-55           | 20-30                    |
|                          | 18-22 | Unweathered<br>bedrock.                                                      | ---                        | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Rock outcrop.            |       |                                                                              |                            |          |                                 |                                      |        |       |       |                 |                          |
| 1085*:<br>Trunk-----     | 0-5   | Gravelly loam----                                                            | GM-GC,<br>SM-SC,<br>GM, SM | A-4      | 0-5                             | 55-80                                | 50-75  | 45-70 | 35-50 | 20-30           | NP-10                    |
|                          | 5-28  | Gravelly clay,<br>gravelly clay<br>loam.                                     | CL, CH, GC                 | A-7      | 0-10                            | 55-85                                | 50-80  | 45-75 | 40-65 | 40-55           | 20-30                    |
|                          | 28-32 | Unweathered<br>bedrock.                                                      | ---                        | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Dewar-----               | 0-4   | Very cobbly loam                                                             | SM-SC,<br>CL-ML            | A-4      | 40-50                           | 70-95                                | 65-80  | 55-75 | 40-55 | 25-30           | 5-10                     |
|                          | 4-14  | Cobbly silty clay<br>loam.                                                   | CL                         | A-6, A-7 | 25-30                           | 85-95                                | 80-90  | 75-90 | 65-85 | 35-45           | 15-20                    |
|                          | 14-19 | Very cobbly silt<br>loam.                                                    | GC                         | A-6      | 30-40                           | 50-60                                | 45-55  | 40-50 | 35-45 | 30-35           | 10-15                    |
|                          | 19-32 | Indurated-----                                                               | ---                        | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                          | 32-60 | Gravelly sandy<br>loam.                                                      | GM, SM                     | A-1      | 0                               | 55-65                                | 50-60  | 30-40 | 15-25 | 20-25           | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                          | Classification       |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|-----------------------------------------------------------------------|----------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                          |       |                                                                       | Unified              | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                          | In    |                                                                       |                      |          | Pct                             |                                      |       |       |       |                        |                          |
| 1085*:<br>Stingdorn----- | 0-7   | Very cobbly loam                                                      | SM-SC                | A-2, A-4 | 30-50                           | 70-85                                | 55-70 | 40-55 | 30-40 | 20-30                  | 5-10                     |
|                          | 7-15  | Very cobbly clay loam.                                                | GC                   | A-6      | 30-50                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-40                  | 15-20                    |
|                          | 15-20 | Indurated-----                                                        | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                          | 20    | Unweathered bedrock.                                                  | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1086*:<br>Trunk-----     | 0-5   | Cobbly loam-----                                                      | CL-ML, ML            | A-4      | 15-30                           | 75-95                                | 70-90 | 60-90 | 50-70 | 20-30                  | NP-10                    |
|                          | 5-28  | Gravelly clay, gravelly clay loam.                                    | CL, CH, GC           | A-7      | 0-10                            | 55-85                                | 50-80 | 45-75 | 40-65 | 40-55                  | 20-30                    |
|                          | 28-32 | Unweathered bedrock.                                                  | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                          |       |                                                                       |                      |          |                                 |                                      |       |       |       |                        |                          |
| Malpais-----             | 0-3   | Gravelly loam----                                                     | GM                   | A-4      | 5-10                            | 60-75                                | 55-70 | 45-60 | 35-50 | 20-25                  | NP-5                     |
|                          | 3-15  | Very gravelly loam, very gravelly sandy loam, very cobbly sandy loam. | GM                   | A-1, A-2 | 5-35                            | 50-60                                | 35-50 | 30-45 | 20-35 | 20-25                  | NP-5                     |
|                          | 15-60 | Extremely cobbly loam, very cobbly loam, extremely cobbly sandy loam. | GM                   | A-1, A-2 | 40-50                           | 40-55                                | 35-50 | 25-35 | 20-30 | 20-25                  | NP-5                     |
|                          |       |                                                                       |                      |          |                                 |                                      |       |       |       |                        |                          |
| Minat-----               | 0-9   | Gravelly loam----                                                     | GM-GC, GC            | A-4, A-6 | 5-10                            | 65-75                                | 55-70 | 50-65 | 35-50 | 25-35                  | 5-15                     |
|                          | 9-27  | Very gravelly loam.                                                   | GC, GM-GC            | A-2      | 0-10                            | 45-60                                | 30-50 | 25-45 | 20-35 | 25-35                  | 5-15                     |
|                          | 27-60 | Very gravelly loam, very gravelly fine sandy loam.                    | GM-GC, GC            | A-2      | 0-10                            | 45-60                                | 30-50 | 20-45 | 15-30 | 25-35                  | 5-15                     |
|                          |       |                                                                       |                      |          |                                 |                                      |       |       |       |                        |                          |
| 1087*:<br>Trunk-----     | 0-5   | Very cobbly loam                                                      | GM-GC, SM-SC, SC, GC | A-4, A-6 | 30-45                           | 55-80                                | 50-75 | 45-70 | 35-50 | 25-35                  | 5-15                     |
|                          | 5-28  | Gravelly clay, gravelly clay loam.                                    | CL, GC, CH           | A-7      | 0-10                            | 55-85                                | 50-80 | 45-75 | 40-65 | 40-55                  | 20-30                    |
|                          | 28-32 | Unweathered bedrock.                                                  | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                          |       |                                                                       |                      |          |                                 |                                      |       |       |       |                        |                          |
| Burrita-----             | 0-3   | Very cobbly loam                                                      | GM-GC                | A-4      | 25-40                           | 60-70                                | 55-65 | 50-60 | 35-45 | 15-25                  | 5-10                     |
|                          | 3-18  | Very cobbly clay, very stony clay loam, very gravelly clay loam.      | GC, SC               | A-2, A-7 | 10-55                           | 35-75                                | 30-55 | 25-50 | 20-45 | 40-55                  | 20-30                    |
|                          | 18-22 | Unweathered bedrock.                                                  | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                          |       |                                                                       |                      |          |                                 |                                      |       |       |       |                        |                          |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                          | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|---------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
|                          |       |                                                                                       | Unified         | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                 |                          |
|                          | In    |                                                                                       |                 |          | Pct                             |                                      |        |        |        | Pct             |                          |
| 1087*:<br>Colbar-----    | 0-3   | Very cobbly loam                                                                      | CL-ML           | A-4      | 50-60                           | 90-100                               | 85-95  | 75-85  | 50-60  | 20-30           | 5-10                     |
|                          | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                           | CL              | A-6      | 10-35                           | 90-95                                | 70-85  | 60-80  | 50-65  | 30-40           | 10-20                    |
|                          | 22-26 | Gravelly loam,<br>cobbly loam.                                                        | SM-SC,<br>CL-ML | A-4      | 5-30                            | 75-95                                | 60-90  | 55-75  | 35-55  | 20-30           | 5-10                     |
|                          | 26-30 | Unweathered<br>bedrock.                                                               | ---             | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---             | ---                      |
| 1091-----<br>Tulase      | 0-6   | Silt loam-----                                                                        | CL-ML, ML       | A-4      | 0                               | 100                                  | 100    | 100    | 90-100 | 15-25           | NP-10                    |
|                          | 6-60  | Very fine sandy<br>loam, silt loam.                                                   | CL-ML, ML       | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-85  | 15-25           | NP-10                    |
| 1092*:<br>Tulase-----    | 0-6   | Silt loam-----                                                                        | CL-ML, ML       | A-4      | 0                               | 100                                  | 100    | 100    | 90-100 | 15-25           | NP-10                    |
|                          | 6-60  | Very fine sandy<br>loam, silt loam.                                                   | CL-ML, ML       | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-85  | 15-25           | NP-10                    |
| Bubus-----               | 0-6   | Very fine sandy<br>loam.                                                              | ML              | A-4      | 0                               | 85-95                                | 75-90  | 70-80  | 50-60  | 25-30           | NP-5                     |
|                          | 6-60  | Stratified sandy<br>loam to silt<br>loam.                                             | ML              | A-4      | 0                               | 95-100                               | 90-100 | 80-90  | 50-60  | 25-30           | NP-5                     |
| McConnel-----            | 0-2   | Loam-----                                                                             | ML              | A-4      | 0                               | 95-100                               | 85-95  | 70-80  | 50-60  | 15-25           | NP-5                     |
|                          | 2-12  | Loam, sandy loam,<br>fine sandy loam.                                                 | ML, SM          | A-4      | 0                               | 95-100                               | 90-100 | 65-80  | 45-60  | 15-25           | NP-5                     |
|                          | 12-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly coarse<br>sand. | GP              | A-1      | 0-15                            | 25-35                                | 10-35  | 5-15   | 0-5    | ---             | NP                       |
| 1102-----<br>Tweba       | 0-11  | Very fine sandy<br>loam.                                                              | ML, CL-ML       | A-4      | 0                               | 100                                  | 100    | 90-100 | 65-85  | 20-30           | NP-10                    |
|                          | 11-21 | Fine sandy loam,<br>very fine sandy<br>loam, loam.                                    | ML              | A-4      | 0                               | 100                                  | 100    | 80-95  | 50-65  | 20-25           | NP-5                     |
|                          | 21-60 | Stratified very<br>fine sandy loam<br>to loamy sand.                                  | SM              | A-2, A-4 | 0                               | 90-100                               | 90-100 | 55-75  | 25-45  | 15-20           | NP-5                     |
| 1110-----<br>Umberland   | 0-4   | Silty clay loam                                                                       | CL              | A-7      | 0                               | 100                                  | 100    | 95-100 | 85-100 | 40-50           | 20-25                    |
|                          | 4-60  | Silty clay loam,<br>silty clay.                                                       | CL, CH          | A-7      | 0                               | 100                                  | 100    | 95-100 | 85-100 | 40-55           | 25-30                    |
| 1140-----<br>Wendane     | 0-13  | Silt loam-----                                                                        | ML              | A-4      | 0                               | 100                                  | 100    | 90-100 | 70-95  | 30-40           | NP-10                    |
|                          | 13-27 | Silt loam, very<br>fine sandy loam.                                                   | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80  | 30-40           | NP-10                    |
|                          | 27-65 | Stratified silt<br>loam to clay<br>loam.                                              | CL, ML          | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45           | 10-20                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                            | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|---------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|------------------------|--------------------------|
|                          |       |                                                         | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                        |                          |
|                          | In    |                                                         |                |          | Pct                             |                                      |        |        |        |                        |                          |
| 1141-----<br>Wendane     | 0-13  | Silt loam-----                                          | ML             | A-4      | 0                               | 100                                  | 100    | 90-100 | 85-100 | 30-40                  | 5-10                     |
|                          | 13-40 | Silt loam, silty<br>clay loam.                          | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-100 | 30-40                  | 5-10                     |
|                          | 40-60 | Stratified sand<br>to gravelly<br>sand.                 | SP-SM, SM      | A-1      | 0                               | 75-95                                | 65-85  | 25-40  | 5-15   | ---                    | NP                       |
| 1142*:<br>Wendane-----   | 0-13  | Very fine sandy<br>loam.                                | ML, CL-ML      | A-4      | 0                               | 100                                  | 100    | 80-95  | 55-70  | 20-30                  | NP-10                    |
|                          | 13-27 | Silt loam, very<br>fine sandy loam.                     | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80  | 30-40                  | NP-10                    |
|                          | 27-60 | Stratified silt<br>loam to clay<br>loam.                | CL, ML         | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 10-20                    |
| Tweba-----               | 0-11  | Very fine sandy<br>loam.                                | ML, CL-ML      | A-4      | 0                               | 100                                  | 100    | 90-100 | 65-85  | 20-30                  | NP-10                    |
|                          | 11-21 | Fine sandy loam,<br>very fine sandy<br>loam, loam.      | ML             | A-4      | 0                               | 100                                  | 100    | 80-95  | 50-65  | 20-25                  | NP-5                     |
|                          | 21-60 | Stratified very<br>fine sandy loam<br>to loamy sand.    | SM             | A-2, A-4 | 0                               | 90-100                               | 90-100 | 55-75  | 25-45  | 15-20                  | NP-5                     |
| 1143-----<br>Wendane     | 0-13  | Silt loam-----                                          | ML             | A-4      | 0                               | 100                                  | 100    | 90-100 | 70-95  | 30-40                  | NP-10                    |
|                          | 13-27 | Silt loam, very<br>fine sandy loam.                     | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80  | 30-40                  | NP-10                    |
|                          | 27-60 | Stratified silt<br>loam to clay<br>loam.                | CL, ML         | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 10-20                    |
| 1144*:<br>Wendane-----   | 0-13  | Silt loam-----                                          | ML             | A-4      | 0                               | 100                                  | 100    | 90-100 | 70-95  | 30-40                  | NP-10                    |
|                          | 13-27 | Silt loam, very<br>fine sandy loam.                     | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80  | 30-40                  | NP-10                    |
|                          | 27-60 | Stratified silt<br>loam to clay<br>loam.                | CL, ML         | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 10-20                    |
| Batan-----               | 0-5   | Silt loam-----                                          | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-35                  | 5-10                     |
|                          | 5-68  | Stratified silt<br>loam to silty<br>clay loam.          | CL             | A-6      | 0                               | 100                                  | 100    | 95-100 | 85-95  | 30-40                  | 15-25                    |
| Broyles-----             | 0-5   | Silt loam-----                                          | ML             | A-4      | 0                               | 100                                  | 100    | 90-100 | 60-80  | 20-25                  | NP-5                     |
|                          | 5-11  | Silt loam, very<br>fine sandy loam,<br>fine sandy loam. | ML, SM         | A-4      | 0                               | 95-100                               | 90-100 | 75-90  | 40-55  | 20-25                  | NP-5                     |
|                          | 11-60 | Stratified loam<br>to gravelly<br>loamy sand.           | SM             | A-2      | 0                               | 70-100                               | 60-95  | 30-40  | 25-35  | ---                    | NP                       |
| 1145*:<br>Wendane-----   | 0-13  | Silt loam-----                                          | ML             | A-4      | 0                               | 100                                  | 100    | 90-100 | 70-95  | 30-40                  | NP-10                    |
|                          | 13-27 | Silt loam, very<br>fine sandy loam.                     | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 70-80  | 30-40                  | NP-10                    |
|                          | 27-60 | Stratified silt<br>loam to clay<br>loam.                | CL, ML         | A-6, A-7 | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45                  | 10-20                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                       | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|--------|--------|--------|-----------------|--------------------------|
|                             |       |                                                                                    | Unified                 | AASHTO           |                                 | 4                                    | 10     | 40     | 200    |                 |                          |
|                             | In    |                                                                                    |                         |                  | Pct                             |                                      |        |        |        | Pct             |                          |
| 1145*:<br>Playas.           |       |                                                                                    |                         |                  |                                 |                                      |        |        |        |                 |                          |
| 1146*:<br>Wendane-----      | 0-13  | Silt loam-----                                                                     | ML                      | A-4              | 0                               | 100                                  | 100    | 90-100 | 70-95  | 30-40           | NP-10                    |
|                             | 13-27 | Silt loam, very<br>fine sandy loam.                                                | ML                      | A-4              | 0                               | 100                                  | 100    | 95-100 | 70-80  | 30-40           | NP-10                    |
|                             | 27-60 | Stratified silt<br>loam to clay<br>loam.                                           | CL, ML                  | A-6, A-7         | 0                               | 100                                  | 100    | 95-100 | 85-95  | 35-45           | 10-20                    |
| Sonoma-----                 | 0-10  | Silt loam-----                                                                     | CL                      | A-6              | 0                               | 95-100                               | 95-100 | 85-100 | 70-90  | 30-35           | 10-15                    |
|                             | 10-60 | Stratified silt<br>loam to silty<br>clay loam.                                     | CL, ML                  | A-6, A-7         | 0                               | 100                                  | 100    | 100    | 95-100 | 35-50           | 10-25                    |
| Valmy-----                  | 0-6   | Very fine sandy<br>loam.                                                           | SM                      | A-4              | 0                               | 90-100                               | 85-100 | 60-75  | 35-50  | 15-25           | NP-5                     |
|                             | 6-42  | Stratified very<br>fine sandy loam<br>to gravelly<br>coarse sandy<br>loam.         | SM                      | A-4, A-2,<br>A-1 | 0-5                             | 80-95                                | 75-90  | 40-70  | 20-45  | 15-25           | NP-5                     |
|                             | 42-60 | Gravelly sand,<br>very gravelly<br>sand.                                           | SP-SM, SM,<br>GP-GM, GM | A-1              | 0-10                            | 40-75                                | 30-70  | 20-45  | 5-15   | ---             | NP                       |
| 1150-----<br>Weso           | 0-5   | Fine sandy loam                                                                    | SM, ML                  | A-4              | 0                               | 95-100                               | 90-100 | 70-80  | 40-55  | 15-25           | NP-5                     |
|                             | 5-11  | Fine sandy loam,<br>very fine sandy<br>loam, loam.                                 | ML, CL-ML,<br>SM, SM-SC | A-4              | 0                               | 95-100                               | 85-95  | 70-85  | 45-60  | 15-30           | NP-10                    |
|                             | 11-60 | Fine sandy loam,<br>very fine sandy<br>loam.                                       | ML, SM                  | A-4              | 0                               | 95-100                               | 85-95  | 70-85  | 45-60  | 15-25           | NP-5                     |
| 1158-----<br>Whirlo         | 0-7   | Very fine sandy<br>loam.                                                           | SM                      | A-4              | 0-5                             | 90-100                               | 90-100 | 75-90  | 35-50  | 20-25           | NP-5                     |
|                             | 7-13  | Fine sandy loam                                                                    | SM                      | A-2, A-4         | 0                               | 90-100                               | 85-100 | 65-80  | 25-40  | 20-25           | NP-5                     |
|                             | 13-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam. | GP-GM                   | A-1              | 0-5                             | 40-50                                | 20-35  | 15-25  | 5-10   | 20-25           | NP-5                     |
| 1160-----<br>Whirlo         | 0-12  | Gravelly loam----                                                                  | ML, GM                  | A-4              | 0                               | 60-75                                | 55-75  | 50-70  | 40-60  | ---             | NP                       |
|                             | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                        | GM                      | A-1, A-2         | 0-5                             | 45-55                                | 35-50  | 30-40  | 15-35  | ---             | NP                       |
|                             | 24-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam. | GW-GM,<br>GP-GM         | A-1              | 0-5                             | 40-50                                | 20-35  | 10-25  | 5-10   | ---             | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol  | Depth | USDA texture                                                                       | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|---------------------------|-------|------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                           |       |                                                                                    | Unified         | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                           | In    |                                                                                    |                 |          | Pct                             |                                      |        |        |       |                        |                          |
| 1162, 1163-----<br>Whirlo | 0-12  | Silt loam-----                                                                     | ML              | A-4      | 0                               | 80-95                                | 75-90  | 70-85  | 55-70 | 20-25                  | NP-5                     |
|                           | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                        | GM              | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40  | 15-35 | ---                    | NP                       |
|                           | 24-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam. | GW-GM,<br>GP-GM | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25  | 5-10  | ---                    | NP                       |
| 1165*:<br>Whirlo-----     | 0-12  | Gravelly loam----                                                                  | ML, GM          | A-4      | 0                               | 60-75                                | 55-75  | 50-70  | 40-60 | ---                    | NP                       |
|                           | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                        | GM              | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40  | 15-35 | ---                    | NP                       |
|                           | 24-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam. | GW-GM,<br>GP-GM | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25  | 5-10  | ---                    | NP                       |
| Creemon-----              | 0-10  | Silt loam-----                                                                     | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | ---                    | NP                       |
|                           | 10-15 | Very fine sandy<br>loam, silt loam.                                                | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                           | 15-45 | Stratified very<br>fine sandy loam<br>to silt loam.                                | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-90 | 25-30                  | NP-5                     |
|                           | 45-60 | Stratified<br>gravelly very<br>fine sandy loam<br>to fine sandy<br>loam.           | SM              | A-4      | 0                               | 80-90                                | 70-85  | 60-70  | 35-50 | ---                    | NP                       |
| 1166*:<br>Whirlo-----     | 0-12  | Silt loam-----                                                                     | ML              | A-4      | 0                               | 80-95                                | 75-90  | 70-85  | 55-70 | 20-25                  | NP-5                     |
|                           | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                        | GM              | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40  | 15-35 | ---                    | NP                       |
|                           | 24-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam. | GW-GM,<br>GP-GM | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25  | 5-10  | ---                    | NP                       |
| Pumper-----               | 0-12  | Silt loam-----                                                                     | ML              | A-4      | 0                               | 95-100                               | 85-100 | 75-85  | 60-70 | 20-30                  | NP-5                     |
|                           | 12-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sand.       | GP, GP-GM       | A-1      | 0-5                             | 20-40                                | 20-35  | 10-20  | 0-10  | ---                    | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                       | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                             |       |                                                                                    | Unified         | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                             | In    |                                                                                    |                 |          | Pct                             |                                      |        |        |       | Pct             |                          |
| 1168*:<br>Whirlo-----       | 0-12  | Gravelly very<br>fine sandy loam.                                                  | ML, GM          | A-4      | 0                               | 60-75                                | 55-75  | 50-70  | 40-60 | ---             | NP                       |
|                             | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                        | GM              | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40  | 15-35 | ---             | NP                       |
|                             | 24-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam. | GW-GM,<br>GP-GM | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25  | 5-10  | ---             | NP                       |
| Oxcorel-----                | 0-5   | Very fine sandy<br>loam.                                                           | ML              | A-4      | 0-5                             | 90-100                               | 90-100 | 70-85  | 50-65 | 20-30           | NP-5                     |
|                             | 5-20  | Clay, clay loam                                                                    | CL, CH          | A-7      | 0-5                             | 85-95                                | 80-90  | 75-85  | 65-80 | 40-55           | 20-30                    |
|                             | 20-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                | GM              | A-1      | 0-15                            | 30-60                                | 25-50  | 20-40  | 15-25 | 15-25           | NP-5                     |
| 1169*:<br>Whirlo-----       | 0-12  | Gravelly very<br>fine sandy loam.                                                  | ML, GM          | A-4      | 0                               | 60-75                                | 55-75  | 50-70  | 40-60 | ---             | NP                       |
|                             | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                        | GM              | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40  | 15-35 | ---             | NP                       |
|                             | 24-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam. | GW-GM,<br>GP-GM | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25  | 5-10  | ---             | NP                       |
| Broyles-----                | 0-11  | Very fine sandy<br>loam.                                                           | ML              | A-4      | 0                               | 100                                  | 95-100 | 85-95  | 60-75 | ---             | NP                       |
|                             | 11-60 | Stratified loam<br>to gravelly<br>loamy sand.                                      | SM              | A-2      | 0                               | 70-100                               | 60-95  | 30-40  | 25-35 | ---             | NP                       |
| 1170-----<br>Wholan         | 0-5   | Silt loam-----                                                                     | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 80-90 | 20-30           | NP-5                     |
|                             | 5-60  | Very fine sandy<br>loam, silt loam.                                                | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 75-90 | 20-30           | NP-5                     |
| 1174-----<br>Wholan         | 0-6   | Silt loam-----                                                                     | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 80-90 | 20-30           | NP-5                     |
|                             | 6-45  | Very fine sandy<br>loam, silt loam.                                                | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 75-90 | 20-30           | NP-5                     |
|                             | 45-60 | Stratified very<br>gravelly loam to<br>very gravelly<br>sand.                      | GP-GM, GM       | A-1      | 0-10                            | 35-45                                | 30-40  | 15-25  | 5-20  | 15-25           | NP-5                     |
| 1177*:<br>Wholan-----       | 0-5   | Very fine sandy<br>loam.                                                           | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 75-80 | 15-25           | NP-5                     |
|                             | 5-60  | Very fine sandy<br>loam, silt loam.                                                | ML              | A-4      | 0                               | 100                                  | 100    | 95-100 | 75-90 | 20-30           | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                            | Classification |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |        |        | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------------------------|----------------|------------------|---------------------------------|--------------------------------------|-------|--------|--------|------------------------|--------------------------|
|                             |       |                                                                                                         | Unified        | AASHTO           |                                 | 4                                    | 10    | 40     | 200    |                        |                          |
|                             | In    |                                                                                                         |                |                  | Pct                             |                                      |       |        |        | Pct                    |                          |
| 1177*:<br>Rasille-----      | 0-6   | Silt loam-----                                                                                          | ML             | A-4              | 0                               | 100                                  | 100   | 95-100 | 85-100 | 20-30                  | NP-5                     |
|                             | 6-15  | Silt loam, very<br>fine sandy loam.                                                                     | ML             | A-4              | 0                               | 100                                  | 100   | 95-100 | 75-100 | 20-30                  | NP-5                     |
|                             | 15-60 | Silt loam, very<br>fine sandy loam.                                                                     | ML             | A-4              | 0                               | 100                                  | 100   | 95-100 | 75-100 | 20-30                  | NP-5                     |
| 1178*:<br>Wholan-----       | 0-5   | Silt loam-----                                                                                          | ML             | A-4              | 0                               | 100                                  | 100   | 95-100 | 80-90  | 20-30                  | NP-5                     |
|                             | 5-60  | Very fine sandy<br>loam, silt loam.                                                                     | ML             | A-4              | 0                               | 100                                  | 100   | 95-100 | 75-90  | 20-30                  | NP-5                     |
| Rasille-----                | 0-6   | Silt loam-----                                                                                          | ML             | A-4              | 0                               | 100                                  | 100   | 95-100 | 85-100 | 20-30                  | NP-5                     |
|                             | 6-15  | Silt loam, very<br>fine sandy loam.                                                                     | ML             | A-4              | 0                               | 100                                  | 100   | 95-100 | 75-100 | 20-30                  | NP-5                     |
|                             | 15-41 | Silt loam, very<br>fine sandy loam.                                                                     | ML             | A-4              | 0                               | 100                                  | 100   | 95-100 | 75-100 | 20-30                  | NP-5                     |
|                             | 41-60 | Stratified fine<br>sandy loam to<br>very gravelly<br>coarse sand.                                       | SM, GM         | A-1              | 0                               | 55-80                                | 50-75 | 15-35  | 10-20  | ---                    | NP                       |
| 1201*:<br>Slaven-----       | 0-4   | Very gravelly<br>loam.                                                                                  | GM             | A-2              | 0                               | 45-55                                | 35-45 | 30-40  | 25-30  | 25-30                  | NP-5                     |
|                             | 4-22  | Extremely<br>gravelly clay,<br>extremely<br>gravelly sandy<br>clay, extremely<br>gravelly clay<br>loam. | GC             | A-2              | 0-15                            | 25-35                                | 15-25 | 15-20  | 10-20  | 40-50                  | 25-35                    |
|                             | 22-26 | Unweathered<br>bedrock.                                                                                 | ---            | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---                    | ---                      |
| Linrose-----                | 0-8   | Gravelly loam----                                                                                       | ML, GM         | A-4              | 0-10                            | 65-85                                | 55-75 | 50-70  | 35-60  | 15-25                  | NP-5                     |
|                             | 8-26  | Very gravelly<br>loam, very<br>gravelly sandy<br>loam.                                                  | GC, GM-GC      | A-2              | 0-15                            | 40-60                                | 30-50 | 25-45  | 15-35  | 25-35                  | 5-15                     |
|                             | 26    | Unweathered<br>bedrock.                                                                                 | ---            | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---                    | ---                      |
| Cleavage-----               | 0-4   | Very gravelly<br>loam.                                                                                  | GM-GC, GC      | A-2, A-4,<br>A-6 | 0-10                            | 50-70                                | 30-50 | 25-45  | 20-40  | 25-35                  | 5-15                     |
|                             | 4-15  | Very cobbly clay<br>loam, extremely<br>gravelly clay<br>loam, very<br>gravelly loam.                    | GC             | A-2              | 0-45                            | 40-55                                | 30-45 | 25-45  | 20-35  | 30-45                  | 10-20                    |
|                             | 15-19 | Unweathered<br>bedrock.                                                                                 | ---            | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---                    | ---                      |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                            | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                                         | Unified                 | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                                         |                         |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 1202*:<br>Slaven-----       | 0-4   | Very gravelly<br>loam.                                                                                  | GM                      | A-2              | 0                               | 45-55                                | 35-45 | 30-40 | 25-30 | 25-30           | NP-5                     |
|                             | 4-22  | Extremely<br>gravelly clay,<br>extremely<br>gravelly sandy<br>clay, extremely<br>gravelly clay<br>loam. | GC                      | A-2              | 0-15                            | 25-35                                | 15-25 | 15-20 | 10-20 | 40-50           | 25-35                    |
|                             | 22-26 | Unweathered<br>bedrock.                                                                                 | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Wiskan-----                 | 0-16  | Gravelly loam----                                                                                       | SM, CL-ML,<br>SM-SC, ML | A-4              | 0-15                            | 70-85                                | 60-75 | 55-75 | 40-60 | 20-30           | NP-10                    |
|                             | 16-28 | Very gravelly<br>clay loam, very<br>gravelly loam,<br>extremely<br>gravelly clay<br>loam.               | GC                      | A-2              | 10-25                           | 40-55                                | 30-45 | 25-45 | 20-35 | 30-40           | 10-20                    |
|                             | 28    | Unweathered<br>bedrock.                                                                                 | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Graley Variant--            | 0-7   | Very gravelly<br>loam.                                                                                  | GM                      | A-1, A-2         | 0-5                             | 35-55                                | 30-50 | 25-45 | 20-30 | 15-25           | NP-5                     |
|                             | 7-15  | Very gravelly<br>clay loam, very<br>gravelly clay.                                                      | GC                      | A-2, A-7         | 10-25                           | 40-55                                | 35-50 | 35-50 | 30-45 | 40-55           | 20-30                    |
|                             | 15    | Unweathered<br>bedrock.                                                                                 | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 1203*:<br>Slaven-----       | 0-4   | Very gravelly<br>loam.                                                                                  | GM                      | A-2              | 0                               | 45-55                                | 35-45 | 30-40 | 25-30 | 25-30           | NP-5                     |
|                             | 4-22  | Extremely<br>gravelly clay,<br>extremely<br>gravelly sandy<br>clay, extremely<br>gravelly clay<br>loam. | GC                      | A-2              | 0-15                            | 25-35                                | 15-25 | 15-20 | 10-20 | 40-50           | 25-35                    |
|                             | 22-26 | Unweathered<br>bedrock.                                                                                 | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Glean-----                  | 0-6   | Gravelly loam----                                                                                       | SM, GM                  | A-2, A-4         | 0-10                            | 55-80                                | 50-75 | 40-60 | 25-40 | 20-30           | NP-5                     |
|                             | 6-49  | Very gravelly<br>sandy loam, very<br>gravelly loam.                                                     | GM                      | A-1, A-2         | 0-25                            | 30-65                                | 25-60 | 20-50 | 10-35 | 20-30           | NP-5                     |
|                             | 49-53 | Unweathered<br>bedrock.                                                                                 | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Cleavage-----               | 0-4   | Very gravelly<br>loam.                                                                                  | GM-GC, GC               | A-2, A-4,<br>A-6 | 0-10                            | 50-70                                | 30-50 | 25-45 | 20-40 | 25-35           | 5-15                     |
|                             | 4-15  | Very cobbly clay<br>loam, extremely<br>gravelly clay<br>loam, very<br>gravelly loam.                    | GC                      | A-2              | 0-45                            | 40-55                                | 30-45 | 25-45 | 20-35 | 30-45           | 10-20                    |
|                             | 15-19 | Unweathered<br>bedrock.                                                                                 | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                        | Classification                |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------|-------------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                     | Unified                       | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                             | In    |                                                                                     |                               |                  | Pct                             |                                      |       |       |       |                        |                          |
| 1212*:<br>Wiskan-----       | 0-16  | Gravelly silt loam.                                                                 | SM, CL-ML,<br>SM-SC, ML       | A-4              | 0-15                            | 70-85                                | 60-75 | 55-75 | 40-60 | 20-30                  | NP-10                    |
|                             | 16-28 | Very gravelly clay loam, very gravelly loam, extremely gravelly clay loam.          | GC                            | A-2              | 10-25                           | 40-55                                | 30-45 | 25-45 | 20-35 | 30-40                  | 10-20                    |
|                             | 28    | Unweathered bedrock.                                                                | ---                           | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Roca-----                   | 0-5   | Extremely cobbly sandy clay loam.                                                   | GC                            | A-2              | 50-65                           | 45-60                                | 25-40 | 20-35 | 15-30 | 30-40                  | 10-15                    |
|                             | 5-27  | Very gravelly clay loam, very gravelly clay.                                        | GC, SC                        | A-2              | 0-10                            | 60-75                                | 30-50 | 25-45 | 20-35 | 45-60                  | 20-30                    |
|                             | 27-31 | Unweathered bedrock.                                                                | ---                           | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Bregar-----                 | 0-4   | Extremely gravelly sandy loam.                                                      | GP-GC,<br>GP-GM,<br>GM-GC, GM | A-1, A-2         | 10-20                           | 25-35                                | 20-30 | 15-25 | 5-15  | 15-25                  | NP-10                    |
|                             | 4-11  | Very gravelly clay loam, extremely gravelly loam, extremely cobbly sandy clay loam. | GC                            | A-2              | 0-40                            | 25-45                                | 20-35 | 15-30 | 15-25 | 35-45                  | 15-25                    |
|                             | 11-15 | Unweathered bedrock.                                                                | ---                           | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1215*:<br>Wiskan-----       | 0-16  | Gravelly silt loam.                                                                 | SM, CL-ML,<br>SM-SC, ML       | A-4              | 0-15                            | 70-85                                | 60-75 | 55-75 | 40-60 | 20-30                  | NP-10                    |
|                             | 16-28 | Very gravelly clay loam, very gravelly loam, extremely gravelly clay loam.          | GC                            | A-2              | 10-25                           | 40-55                                | 30-45 | 25-45 | 20-35 | 30-40                  | 10-20                    |
|                             | 28    | Unweathered bedrock.                                                                | ---                           | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Locane-----                 | 0-6   | Very gravelly loam.                                                                 | GM-GC                         | A-2              | 5-15                            | 50-65                                | 30-45 | 25-40 | 15-30 | 20-30                  | 5-10                     |
|                             | 6-14  | Very gravelly clay loam.                                                            | GC                            | A-2, A-7,<br>A-6 | 0-10                            | 50-65                                | 35-50 | 30-45 | 25-40 | 35-45                  | 15-20                    |
|                             | 14    | Unweathered bedrock.                                                                | ---                           | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                              | Classification |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------|----------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                           | Unified        | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                           |                |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 1216*:<br>Wiskan-----       | 0-16  | Very gravelly<br>silt loam.                                                               | GM, GM-GC      | A-1, A-2,<br>A-4 | 0-15                            | 40-60                                | 30-50 | 25-50 | 20-40 | 20-30           | NP-10                    |
|                             | 16-28 | Very gravelly<br>clay loam, very<br>gravelly loam,<br>extremely<br>gravelly clay<br>loam. | GC             | A-2              | 10-25                           | 40-55                                | 30-45 | 25-45 | 20-35 | 30-40           | 10-20                    |
|                             | 28    | Unweathered<br>bedrock.                                                                   | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Linrose-----                | 0-8   | Gravelly silt<br>loam.                                                                    | ML, GM         | A-4              | 0-10                            | 65-85                                | 55-75 | 50-70 | 35-60 | 15-25           | NP-5                     |
|                             | 8-26  | Very gravelly<br>loam, very<br>gravelly sandy<br>loam.                                    | GC, GM-GC      | A-2              | 0-15                            | 40-60                                | 30-50 | 25-45 | 15-35 | 25-35           | 5-15                     |
|                             | 26    | Unweathered<br>bedrock.                                                                   | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 1220*:<br>Boulflat-----     | 0-6   | Gravelly loam----                                                                         | GM             | A-4              | 0                               | 60-75                                | 50-75 | 45-65 | 35-50 | 20-25           | NP-5                     |
|                             | 6-23  | Gravelly loam,<br>gravelly clay<br>loam, gravelly<br>sandy clay loam.                     | GC             | A-2, A-6         | 0                               | 60-75                                | 50-75 | 45-65 | 25-50 | 30-35           | 10-15                    |
|                             | 23-32 | Cemented-----                                                                             | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 32-36 | Unweathered<br>bedrock.                                                                   | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Havingdon-----              | 0-3   | Gravelly silt<br>loam.                                                                    | GM, GM-GC      | A-4              | 0-10                            | 60-70                                | 50-65 | 50-60 | 35-50 | 25-35           | 5-10                     |
|                             | 3-22  | Very gravelly<br>clay, very<br>gravelly sandy<br>clay, extremely<br>gravelly clay.        | GC             | A-2              | 0                               | 30-40                                | 15-35 | 15-30 | 10-25 | 40-50           | 15-25                    |
|                             | 22-26 | Unweathered<br>bedrock.                                                                   | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Dewar-----                  | 0-4   | Cobbly loam-----                                                                          | CL-ML          | A-4              | 15-40                           | 85-95                                | 80-90 | 65-80 | 50-65 | 25-30           | 5-10                     |
|                             | 4-14  | Cobbly silty clay<br>loam.                                                                | CL             | A-6, A-7         | 25-30                           | 85-95                                | 80-90 | 75-90 | 65-85 | 35-45           | 15-20                    |
|                             | 14-19 | Very cobbly silt<br>loam.                                                                 | GC             | A-6              | 30-40                           | 50-60                                | 45-55 | 40-50 | 35-45 | 30-35           | 10-15                    |
|                             | 19-32 | Indurated-----                                                                            | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 32-60 | Gravelly sandy<br>loam.                                                                   | GM, SM         | A-1              | 0                               | 55-65                                | 50-60 | 30-40 | 15-25 | 20-25           | NP-5                     |
| 1221*:<br>Boulflat-----     | 0-6   | Gravelly loam----                                                                         | GM             | A-4              | 0                               | 60-75                                | 50-75 | 45-65 | 35-50 | 20-25           | NP-5                     |
|                             | 6-23  | Gravelly loam,<br>gravelly clay<br>loam, gravelly<br>sandy clay loam.                     | GC             | A-2, A-6         | 0                               | 60-75                                | 50-75 | 45-65 | 25-50 | 30-35           | 10-15                    |
|                             | 23-32 | Cemented-----                                                                             | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 32-36 | Unweathered<br>bedrock.                                                                   | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                              | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                           | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                             | In    |                                                                                           |                         |          | Pct                             |                                      |       |       |       |                        |                          |
| 1221*:<br>Colbar-----       | 0-3   | Gravelly loam----                                                                         | SM-SC, SM,<br>GM, GM-GC | A-4      | 0-5                             | 65-85                                | 60-75 | 50-65 | 35-50 | 20-30                  | NP-10                    |
|                             | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                               | CL                      | A-6      | 10-35                           | 75-90                                | 70-85 | 60-80 | 50-65 | 30-40                  | 10-20                    |
|                             | 22-26 | Gravelly loam,<br>cobbly loam.                                                            | SM-SC,<br>CL-ML         | A-4      | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30                  | 5-10                     |
|                             | 26-30 | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Old Camp-----               | 0-2   | Very cobbly loam                                                                          | GM, GM-GC,<br>SM, SM-SC | A-2, A-4 | 25-55                           | 60-70                                | 55-65 | 45-55 | 30-40 | 15-25                  | NP-10                    |
|                             | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC                      | A-2, A-6 | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40                  | 15-25                    |
|                             | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1240*:<br>Redflame-----     | 0-5   | Very gravelly<br>loam.                                                                    | GM-GC, GM               | A-2      | 0-25                            | 40-55                                | 35-50 | 30-40 | 20-35 | 25-35                  | 5-10                     |
|                             | 5-14  | Very gravelly<br>clay loam, very<br>gravelly loam.                                        | GC                      | A-2      | 5-10                            | 45-60                                | 35-50 | 25-40 | 15-30 | 30-40                  | 10-15                    |
|                             | 14-60 | Very gravelly<br>sandy loam.                                                              | GM-GC                   | A-2      | 5-10                            | 45-60                                | 30-45 | 20-35 | 10-25 | 15-25                  | 5-10                     |
| Kingingham-----             | 0-7   | Gravelly very<br>fine sandy loam.                                                         | SM                      | A-2, A-4 | 0-5                             | 70-85                                | 55-70 | 50-65 | 30-50 | 15-25                  | NP-5                     |
|                             | 7-22  | Gravelly clay<br>loam, gravelly<br>clay, gravelly<br>silty clay loam.                     | GC, CL, CH              | A-7      | 0-5                             | 70-85                                | 55-70 | 50-65 | 45-60 | 40-55                  | 20-30                    |
|                             | 22-60 | Indurated-----                                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1263*:<br>Graley-----       | 0-7   | Very gravelly<br>sandy loam.                                                              | GM                      | A-1      | 0-5                             | 35-55                                | 30-50 | 20-30 | 15-25 | 20-25                  | NP-5                     |
|                             | 7-14  | Very gravelly<br>clay loam, very<br>gravelly clay.                                        | GC                      | A-2, A-7 | 0-25                            | 40-55                                | 35-50 | 30-50 | 25-40 | 45-55                  | 20-30                    |
|                             | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Loncan-----                 | 0-14  | Gravelly loam----                                                                         | GC, CL                  | A-6      | 0-15                            | 65-80                                | 60-75 | 50-70 | 35-60 | 30-35                  | 10-15                    |
|                             | 14-31 | Very gravelly<br>loam, extremely<br>cobbly loam,<br>very gravelly<br>sandy clay loam.     | GC                      | A-2      | 10-55                           | 35-60                                | 30-50 | 25-40 | 20-35 | 30-35                  | 10-15                    |
|                             | 31    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                                       | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|----------------------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                                                    | Unified         | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                          | In    |                                                                                                    |                 |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 1263*:<br>Bregar-----    | 0-4   | Extremely<br>gravelly loam.                                                                        | GM-GC, GC       | A-2      | 10-20                           | 35-50                                | 20-30  | 15-25 | 10-20 | 25-35           | 5-15                     |
|                          | 4-11  | Very gravelly<br>sandy clay loam,<br>extremely cobbly<br>clay loam, very<br>gravelly clay<br>loam. | GC              | A-2      | 5-45                            | 40-50                                | 25-35  | 20-30 | 10-25 | 35-45           | 15-25                    |
|                          | 11-15 | Unweathered<br>bedrock.                                                                            | ---             | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 1280*:<br>Ricert-----    | 0-6   | Gravelly fine<br>sandy loam.                                                                       | SM, SM-SC       | A-2, A-4 | 0                               | 65-80                                | 50-75  | 40-60 | 25-40 | 20-30           | NP-10                    |
|                          | 6-18  | Loam, clay loam                                                                                    | CL              | A-6, A-7 | 0                               | 90-100                               | 85-100 | 80-90 | 70-80 | 35-45           | 15-20                    |
|                          | 18-60 | Very gravelly<br>sandy loam, very<br>gravelly loamy<br>sand, extremely<br>gravelly loamy<br>sand.  | GM, GP-GM       | A-1      | 0-15                            | 30-60                                | 20-50  | 15-35 | 5-25  | ---             | NP                       |
| Oxcorel-----             | 0-5   | Gravelly fine<br>sandy loam.                                                                       | SM-SC,<br>GM-GC | A-2, A-4 | 0-10                            | 60-85                                | 55-75  | 40-60 | 25-40 | 25-30           | 5-10                     |
|                          | 5-36  | Clay, clay loam                                                                                    | CL, CH          | A-7      | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55           | 20-30                    |
|                          | 36-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                                | GM              | A-1      | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25           | NP-5                     |
| Whirlo-----              | 0-12  | Gravelly loam----                                                                                  | ML, GM          | A-4      | 0                               | 60-75                                | 55-75  | 50-70 | 40-60 | ---             | NP                       |
|                          | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                                        | GM              | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40 | 15-35 | ---             | NP                       |
|                          | 24-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam.                 | GW-GM,<br>GP-GM | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25 | 5-10  | ---             | NP                       |
| 1281*:<br>Ricert-----    | 0-6   | Gravelly silt<br>loam.                                                                             | SM-SC           | A-4      | 0                               | 75-85                                | 55-75  | 40-55 | 35-50 | 20-30           | 5-10                     |
|                          | 6-18  | Loam, clay loam                                                                                    | CL              | A-6, A-7 | 0                               | 90-100                               | 85-100 | 80-90 | 70-80 | 35-45           | 15-20                    |
|                          | 18-60 | Very gravelly<br>sandy loam, very<br>gravelly loamy<br>sand, extremely<br>gravelly loamy<br>sand.  | GM, GP-GM       | A-1      | 0-15                            | 30-60                                | 20-50  | 15-35 | 5-25  | ---             | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                      | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                                   | Unified         | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                        |                          |
|                             | In    |                                                                                                   |                 |          | Pct                             |                                      |        |       |       |                        |                          |
| 1281*:<br>Whirlo-----       | 0-12  | Fine sandy loam                                                                                   | ML, SM          | A-4      | 0                               | 80-95                                | 75-85  | 65-80 | 45-60 | 20-25                  | NP-5                     |
|                             | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                                       | GM              | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40 | 15-35 | ---                    | NP                       |
|                             | 24-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam.                | GW-GM,<br>GP-GM | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25 | 5-10  | ---                    | NP                       |
| Pineval-----                | 0-5   | Gravelly fine<br>sandy loam.                                                                      | SM-SC           | A-2      | 0                               | 65-85                                | 60-75  | 50-70 | 20-35 | 20-30                  | 5-10                     |
|                             | 5-11  | Very gravelly<br>clay loam, very<br>gravelly loam,<br>very gravelly<br>sandy clay loam.           | GC              | A-2      | 0                               | 35-60                                | 25-50  | 20-40 | 15-35 | 30-40                  | 10-15                    |
|                             | 11-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly sand.                       | GP-GM, GM       | A-1      | 0-25                            | 30-60                                | 20-50  | 15-40 | 5-20  | ---                    | NP                       |
| 1283*:<br>Ricert-----       | 0-6   | Very fine sandy<br>loam.                                                                          | ML, CL-ML       | A-4      | 0-5                             | 90-100                               | 90-100 | 80-95 | 55-70 | 15-25                  | NP-10                    |
|                             | 6-18  | Clay loam, loam                                                                                   | CL              | A-6, A-7 | 0                               | 90-100                               | 85-100 | 80-90 | 70-80 | 35-45                  | 15-20                    |
|                             | 18-60 | Very gravelly<br>sandy loam, very<br>gravelly loamy<br>sand, extremely<br>gravelly loamy<br>sand. | GM, GP-GM       | A-1      | 0-15                            | 30-60                                | 20-50  | 15-35 | 5-25  | 15-20                  | NP-5                     |
| Kingingham-----             | 0-7   | Sandy loam-----                                                                                   | SM              | A-2      | 0-5                             | 80-100                               | 75-95  | 50-70 | 20-35 | 15-25                  | NP-5                     |
|                             | 7-22  | Gravelly clay<br>loam, gravelly<br>clay, gravelly<br>silty clay loam.                             | GC, CL, CH      | A-7      | 0-5                             | 70-85                                | 55-70  | 50-65 | 45-60 | 40-55                  | 20-30                    |
|                             | 22-60 | Indurated-----                                                                                    | ---             | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Oxcorel-----                | 0-8   | Silt loam-----                                                                                    | ML              | A-4      | 0-5                             | 90-100                               | 90-100 | 70-85 | 50-65 | 20-30                  | NP-5                     |
|                             | 8-34  | Clay, clay loam                                                                                   | CL, CH          | A-7      | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                             | 34-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                               | GM              | A-1      | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25                  | NP-5                     |
| 1291*:<br>Kingingham-----   | 0-7   | Gravelly very<br>fine sandy loam.                                                                 | SM              | A-2, A-4 | 0-5                             | 70-85                                | 55-70  | 50-65 | 30-50 | 15-25                  | NP-5                     |
|                             | 7-22  | Gravelly clay<br>loam, gravelly<br>clay, gravelly<br>silty clay loam.                             | GC, CL, CH      | A-7      | 0-5                             | 70-85                                | 55-70  | 50-65 | 45-60 | 40-55                  | 20-30                    |
|                             | 22-60 | Indurated-----                                                                                    | ---             | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol  | Depth | USDA texture                                                           | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|---------------------------|-------|------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                           |       |                                                                        | Unified        | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                           | In    |                                                                        |                |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 1291*:<br>Tenabo-----     | 0-6   | Very fine sandy loam.                                                  | ML             | A-4      | 0                               | 95-100                               | 90-100 | 85-95 | 75-85 | 25-35           | NP-10                    |
|                           | 6-18  | Clay loam, silty clay loam, gravelly clay loam.                        | CL             | A-6      | 0                               | 95-100                               | 70-95  | 60-90 | 50-85 | 30-40           | 15-25                    |
|                           | 18-40 | Indurated-----                                                         | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                           | 40-60 | Stratified very gravelly sandy loam to extremely gravelly coarse sand. | GP-GM, GM      | A-1      | 5-25                            | 40-60                                | 35-55  | 25-35 | 5-20  | ---             | NP                       |
| Sodhouse-----             | 0-3   | Gravelly very fine sandy loam.                                         | SM             | A-2, A-4 | 0-10                            | 65-75                                | 55-65  | 45-65 | 30-40 | 15-25           | NP-5                     |
|                           | 3-17  | Fine sandy loam, very fine sandy loam.                                 | ML, SM         | A-4      | 0                               | 80-100                               | 75-90  | 65-85 | 35-55 | 15-25           | NP-5                     |
|                           | 17-29 | Indurated-----                                                         | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                           | 29-60 | Extremely gravelly sandy loam, very gravelly loamy sand.               | GM, GP-GM      | A-1      | 5-20                            | 25-60                                | 15-50  | 10-40 | 5-25  | ---             | NP                       |
| 1292*:<br>Kingingham----- | 0-7   | Gravelly very fine sandy loam.                                         | SM             | A-2, A-4 | 0-5                             | 70-85                                | 55-70  | 50-65 | 30-50 | 15-25           | NP-5                     |
|                           | 7-22  | Gravelly clay loam, gravelly clay, gravelly silty clay loam.           | GC, CL, CH     | A-7      | 0-5                             | 70-85                                | 55-70  | 50-65 | 45-60 | 40-55           | 20-30                    |
|                           | 22-60 | Indurated-----                                                         | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Golconda-----             | 0-10  | Gravelly very fine sandy loam.                                         | GM-GC          | A-4      | 0-10                            | 65-75                                | 55-65  | 45-65 | 35-50 | 20-30           | 5-10                     |
|                           | 10-23 | Gravelly clay loam, clay loam, silty clay loam.                        | GC, CL         | A-6, A-7 | 0                               | 60-95                                | 55-90  | 50-90 | 40-70 | 35-45           | 15-20                    |
|                           | 23-36 | Cemented-----                                                          | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                           | 36-60 | Very gravelly loamy coarse sand, very gravelly sandy loam.             | GP-GM, GM      | A-1      | 0                               | 30-55                                | 25-50  | 10-40 | 5-20  | ---             | NP                       |
| Whirlo-----               | 0-12  | Gravelly very fine sandy loam.                                         | ML, GM         | A-4      | 0                               | 60-75                                | 55-75  | 50-70 | 40-60 | ---             | NP                       |
|                           | 12-24 | Very gravelly fine sandy loam, very gravelly loam.                     | GM             | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40 | 15-35 | ---             | NP                       |
|                           | 24-60 | Stratified very gravelly loam to extremely gravelly coarse sandy loam. | GW-GM, GP-GM   | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25 | 5-10  | ---             | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol   | Depth | USDA texture                                                                    | Classification |          | Frag-ments<br>> 3 inches | Percentage passing sieve number-- |        |       |       | Liquid limit | Plas-ticity index |
|----------------------------|-------|---------------------------------------------------------------------------------|----------------|----------|--------------------------|-----------------------------------|--------|-------|-------|--------------|-------------------|
|                            |       |                                                                                 | Unified        | AASHTO   |                          | 4                                 | 10     | 40    | 200   |              |                   |
|                            | In    |                                                                                 |                |          | Pct                      |                                   |        |       |       | Pct          |                   |
| 1293*:<br>Kingingham-----  | 0-7   | Gravelly very fine sandy loam.                                                  | SM             | A-2, A-4 | 0-5                      | 70-85                             | 55-70  | 50-65 | 30-50 | 15-25        | NP-5              |
|                            | 7-22  | Gravelly clay loam, gravelly clay, gravelly silty clay loam.                    | GC, CL, CH     | A-7      | 0-5                      | 70-85                             | 55-70  | 50-65 | 45-60 | 40-55        | 20-30             |
|                            | 22-60 | Indurated-----                                                                  | ---            | ---      | ---                      | ---                               | ---    | ---   | ---   | ---          | ---               |
| Oxcorel-----               | 0-5   | Gravelly fine sandy loam.                                                       | SM-SC, GM-GC   | A-2, A-4 | 0-10                     | 60-85                             | 55-75  | 40-60 | 25-40 | 25-30        | 5-10              |
|                            | 5-20  | Clay, clay loam                                                                 | CL, CH         | A-7      | 0-5                      | 85-95                             | 80-90  | 75-85 | 65-80 | 40-55        | 20-30             |
|                            | 20-60 | Very gravelly sandy loam, very gravelly loam.                                   | GM             | A-1      | 0-15                     | 30-60                             | 25-50  | 20-40 | 15-25 | 15-25        | NP-5              |
| 1294*:<br>Kingingham-----  | 0-7   | Gravelly very fine sandy loam.                                                  | SM             | A-2, A-4 | 0-5                      | 70-85                             | 55-70  | 50-65 | 30-50 | 15-25        | NP-5              |
|                            | 7-22  | Gravelly clay loam, gravelly clay, gravelly silty clay loam.                    | GC, CL, CH     | A-7      | 0-5                      | 70-85                             | 55-70  | 50-65 | 45-60 | 40-55        | 20-30             |
|                            | 22-60 | Indurated-----                                                                  | ---            | ---      | ---                      | ---                               | ---    | ---   | ---   | ---          | ---               |
| Whirlo-----                | 0-12  | Fine sandy loam                                                                 | ML, SM         | A-4      | 0                        | 80-95                             | 75-85  | 65-80 | 45-60 | 20-25        | NP-5              |
|                            | 12-24 | Very gravelly fine sandy loam, very gravelly loam.                              | GM             | A-1, A-2 | 0-5                      | 45-55                             | 35-50  | 30-40 | 15-35 | ---          | NP                |
|                            | 24-60 | Stratified very gravelly loam to extremely gravelly coarse sandy loam.          | GW-GM, GP-GM   | A-1      | 0-5                      | 40-50                             | 20-35  | 10-25 | 5-10  | ---          | NP                |
| Beoska-----                | 0-13  | Gravelly very fine sandy loam.                                                  | SM             | A-4      | 0-10                     | 70-80                             | 55-75  | 50-70 | 35-50 | 15-25        | NP-5              |
|                            | 13-24 | Silt loam, silty clay loam.                                                     | CL             | A-6, A-7 | 0                        | 80-100                            | 75-100 | 70-85 | 60-85 | 35-45        | 15-25             |
|                            | 24-55 | Stratified gravelly very fine sandy loam to gravelly sandy loam.                | GM, SM         | A-1, A-2 | 0-10                     | 60-80                             | 55-70  | 30-50 | 20-35 | ---          | NP                |
|                            | 55-60 | Stratified very gravelly sandy loam to extremely gravelly very fine sandy loam. | GM             | A-1      | 0-15                     | 30-55                             | 25-50  | 15-35 | 10-25 | ---          | NP                |
| 1342*:<br>Doowak, cobbly-- | 0-6   | Cobbly sandy loam                                                               | SM, SM-SC      | A-2      | 15-25                    | 80-95                             | 70-85  | 50-65 | 20-35 | 15-25        | NP-10             |
|                            | 6-60  | Stratified extremely gravelly sand to extremely gravelly loamy sand.            | GP             | A-1      | 0-5                      | 30-45                             | 10-25  | 5-20  | 0-5   | ---          | NP                |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                    | Classification             |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------------|----------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                                 | Unified                    | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                                 |                            |          | Pct                             |                                      |       |       |       | Pct             |                          |
| 1342*:<br>Doowak-----       | 0-6   | Very gravelly<br>loamy sand.                                                                    | GM, GP-GM                  | A-1      | 5-10                            | 40-55                                | 30-45 | 15-30 | 5-15  | ---             | NP                       |
|                             | 6-60  | Stratified<br>extremely<br>gravelly sand to<br>extremely<br>gravelly loamy<br>sand.             | GP                         | A-1      | 5-10                            | 30-45                                | 10-25 | 5-20  | 0-5   | ---             | NP                       |
| Veta-----                   | 0-4   | Gravelly sandy<br>loam.                                                                         | SM                         | A-1, A-2 | 0-5                             | 65-80                                | 55-70 | 45-55 | 20-35 | ---             | NP                       |
|                             | 4-20  | Extremely<br>gravelly loam,<br>very gravelly<br>sandy loam, very<br>gravelly loam.              | GM                         | A-1, A-2 | 10-30                           | 40-55                                | 30-50 | 20-40 | 15-30 | ---             | NP                       |
|                             | 20-60 | Stratified<br>extremely<br>gravelly loamy<br>sand to very<br>gravelly loam.                     | GP-GM, GM                  | A-1      | 10-25                           | 30-55                                | 20-50 | 15-35 | 5-20  | ---             | NP                       |
| 1392*:<br>Rock outcrop.     |       |                                                                                                 |                            |          |                                 |                                      |       |       |       |                 |                          |
| Loncan Variant--            | 0-12  | Gravelly silt<br>loam.                                                                          | GM, SM, ML                 | A-4      | 0-10                            | 65-80                                | 60-75 | 55-70 | 40-60 | 20-25           | NP-5                     |
|                             | 12-32 | Very gravelly<br>loam, extremely<br>gravelly sandy<br>loam.                                     | GM                         | A-1      | 10-15                           | 30-45                                | 25-40 | 20-35 | 10-25 | 20-25           | NP-5                     |
|                             | 32    | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Glean-----                  | 0-6   | Gravelly sandy<br>loam.                                                                         | SM, GM                     | A-2, A-4 | 0-10                            | 55-80                                | 50-75 | 40-60 | 25-40 | 20-30           | NP-5                     |
|                             | 6-49  | Very gravelly<br>sandy loam, very<br>gravelly loam.                                             | GM                         | A-1, A-2 | 0-25                            | 30-65                                | 25-60 | 20-50 | 10-35 | 20-30           | NP-5                     |
|                             | 49-53 | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 1400*:<br>Koynik, steep---  | 0-6   | Very cobbly very<br>fine sandy loam.                                                            | SM-SC, SM                  | A-2      | 45-60                           | 65-80                                | 55-70 | 45-65 | 25-35 | 20-30           | NP-10                    |
|                             | 6-8   | Very gravelly<br>loam, very<br>gravelly very<br>fine sandy loam,<br>very gravelly<br>silt loam. | GM-GC,<br>SM-SC,<br>GC, SC | A-2      | 0-5                             | 55-70                                | 35-50 | 30-45 | 15-30 | 25-35           | 5-15                     |
|                             | 8     | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                    | Classification             |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------------|----------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                                 | Unified                    | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                             | In    |                                                                                                 |                            |          | Pct                             |                                      |       |       |       |                        |                          |
| 1400*:<br>Koynik-----       | 0-6   | Very gravelly<br>very fine sandy<br>loam.                                                       | GM-GC,<br>SM-SC,<br>GM, SM | A-2, A-1 | 0-5                             | 55-70                                | 35-50 | 30-45 | 15-30 | 20-30                  | NP-10                    |
|                             | 6-8   | Very gravelly<br>loam, very<br>gravelly very<br>fine sandy loam,<br>very gravelly<br>silt loam. | GM-GC,<br>SM-SC,<br>GC, SC | A-2      | 0-5                             | 55-70                                | 35-50 | 30-45 | 15-30 | 25-35                  | 5-15                     |
|                             | 8     | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Rock outcrop.               |       |                                                                                                 |                            |          |                                 |                                      |       |       |       |                        |                          |
| 1410*:<br>Bojo-----         | 0-4   | Fine sandy loam                                                                                 | SM                         | A-2, A-4 | 10-25                           | 90-100                               | 75-90 | 55-70 | 25-40 | 15-25                  | NP-5                     |
|                             | 4-10  | Sandy clay loam,<br>clay loam.                                                                  | SC                         | A-6      | 0-5                             | 90-100                               | 75-90 | 55-70 | 35-50 | 30-40                  | 10-20                    |
|                             | 10    | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Stingdorn-----              | 0-7   | Gravelly loam----                                                                               | SM-SC                      | A-2, A-4 | 5-10                            | 70-85                                | 55-70 | 40-55 | 30-40 | 20-30                  | 5-10                     |
|                             | 7-15  | Very cobbly clay<br>loam.                                                                       | GC                         | A-6      | 30-50                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-40                  | 15-20                    |
|                             | 15-20 | Indurated-----                                                                                  | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                             | 20    | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1411*:<br>Bojo-----         | 0-4   | Gravelly sandy<br>loam.                                                                         | SM                         | A-2      | 25-40                           | 70-85                                | 65-80 | 50-65 | 25-35 | 15-25                  | NP-5                     |
|                             | 4-10  | Sandy clay loam,<br>clay loam.                                                                  | SC                         | A-6      | 0-5                             | 90-100                               | 75-90 | 55-70 | 35-50 | 30-40                  | 10-20                    |
|                             | 10    | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Rock outcrop.               |       |                                                                                                 |                            |          |                                 |                                      |       |       |       |                        |                          |
| Osoll-----                  | 0-5   | Gravelly loam----                                                                               | GM-GC,<br>CL-ML            | A-4      | 0                               | 60-80                                | 55-75 | 45-65 | 35-60 | 20-25                  | 5-10                     |
|                             | 5-12  | Very gravelly<br>loam, very<br>gravelly fine<br>sandy loam.                                     | GM-GC                      | A-2      | 10-25                           | 30-55                                | 25-50 | 20-50 | 10-35 | 20-25                  | 5-10                     |
|                             | 12-35 | Indurated-----                                                                                  | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                             | 35    | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1412*:<br>Bojo-----         | 0-5   | Very gravelly<br>loam.                                                                          | GM-GC                      | A-2      | 10-25                           | 40-60                                | 35-55 | 30-50 | 20-35 | 20-25                  | 5-10                     |
|                             | 5-8   | Gravelly clay<br>loam, gravelly<br>loam, clay loam.                                             | GC, CL                     | A-6, A-7 | 0-10                            | 70-90                                | 65-85 | 60-80 | 45-70 | 35-45                  | 15-20                    |
|                             | 8     | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                     | Classification |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|--------------------------------------------------------------------------------------------------|----------------|------------------|---------------------------------|--------------------------------------|-------|--------|-------|-----------------|--------------------------|
|                             |       |                                                                                                  | Unified        | AASHTO           |                                 | 4                                    | 10    | 40     | 200   |                 |                          |
|                             | In    |                                                                                                  |                |                  | Pct                             |                                      |       |        |       | Pct             |                          |
| 1412*:<br>Humdun-----       | 0-6   | Silt loam-----                                                                                   | ML             | A-4              | 0                               | 100                                  | 100   | 90-100 | 70-90 | 30-40           | NP-5                     |
|                             | 6-24  | Loam, very fine<br>sandy loam, silt<br>loam.                                                     | ML             | A-4              | 0                               | 100                                  | 100   | 85-95  | 60-80 | 30-40           | NP-5                     |
|                             | 24-41 | Loam, very fine<br>sandy loam, silt<br>loam.                                                     | ML             | A-4              | 0                               | 100                                  | 100   | 85-95  | 60-80 | 30-40           | NP-5                     |
|                             | 41-60 | Very gravelly<br>loam.                                                                           | GM             | A-2, A-1         | 5-10                            | 40-55                                | 35-50 | 25-40  | 20-30 | 20-30           | NP-5                     |
| Boulflat-----               | 0-6   | Gravelly loam----                                                                                | GM             | A-4              | 0                               | 60-75                                | 50-75 | 45-65  | 35-50 | 20-25           | NP-5                     |
|                             | 6-23  | Gravelly loam,<br>gravelly clay<br>loam, gravelly<br>sandy clay loam.                            | GC             | A-2, A-6         | 0                               | 60-75                                | 50-75 | 45-65  | 25-50 | 30-35           | 10-15                    |
|                             | 23-32 | Cemented-----                                                                                    | ---            | ---              | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |
|                             | 32-36 | Unweathered<br>bedrock.                                                                          | ---            | ---              | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |
| 1420*:<br>Sumine-----       | 0-10  | Very gravelly<br>loam.                                                                           | GM-GC          | A-2, A-4         | 10-15                           | 50-65                                | 45-60 | 40-50  | 30-40 | 20-30           | 5-10                     |
|                             | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.                  | GC             | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50  | 25-45 | 35-45           | 15-25                    |
|                             | 30-34 | Unweathered<br>bedrock.                                                                          | ---            | ---              | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |
| Reluctan-----               | 0-8   | Very gravelly<br>loam.                                                                           | GM-GC          | A-2, A-4         | 10-25                           | 35-65                                | 30-55 | 25-55  | 20-40 | 25-30           | 5-10                     |
|                             | 8-33  | Gravelly clay<br>loam, gravelly<br>loam.                                                         | GC, CL         | A-6, A-7         | 0-15                            | 65-85                                | 60-75 | 55-75  | 40-60 | 35-45           | 15-20                    |
|                             | 33-37 | Unweathered<br>bedrock.                                                                          | ---            | ---              | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |
| Cleavage-----               | 0-4   | Very cobbly loam                                                                                 | GM-GC, GC      | A-2, A-4,<br>A-6 | 30-45                           | 55-75                                | 45-65 | 40-60  | 25-50 | 25-35           | 5-15                     |
|                             | 4-15  | Very cobbly clay<br>loam, extremely<br>cobbly sandy<br>clay loam, very<br>gravelly clay<br>loam. | GC             | A-2              | 25-45                           | 40-55                                | 30-45 | 25-45  | 20-35 | 30-45           | 10-20                    |
|                             | 15-19 | Unweathered<br>bedrock.                                                                          | ---            | ---              | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |
| 1421*:<br>Sumine-----       | 0-10  | Very cobbly loam                                                                                 | GM-GC          | A-2, A-4         | 30-55                           | 55-65                                | 50-60 | 40-55  | 30-45 | 20-30           | 5-10                     |
|                             | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.                  | GC             | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50  | 25-45 | 35-45           | 15-25                    |
|                             | 30-34 | Unweathered<br>bedrock.                                                                          | ---            | ---              | ---                             | ---                                  | ---   | ---    | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol   | Depth | USDA texture                                                             | Classification |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|----------------------------|-------|--------------------------------------------------------------------------|----------------|---------------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                            |       |                                                                          | Unified        | AASHTO        |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                            | In    |                                                                          |                |               | Pct                             |                                      |       |       |       | Pct                    |                          |
| 1421*:<br>Softscrabble---- | 0-16  | Cobbly loam-----                                                         | SM-SC          | A-4           | 25-40                           | 75-90                                | 70-85 | 55-70 | 35-50 | 20-30                  | 5-10                     |
|                            | 16-30 | Very cobbly clay loam.                                                   | GC             | A-6, A-7      | 30-45                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-45                  | 15-20                    |
|                            | 30-60 | Very gravelly clay loam.                                                 | GC             | A-2, A-6, A-7 | 0-5                             | 45-60                                | 35-50 | 30-45 | 25-40 | 35-45                  | 15-20                    |
| Walti-----                 | 0-4   | Very cobbly loam                                                         | CL-ML, ML      | A-4           | 30-40                           | 75-90                                | 65-80 | 55-70 | 50-60 | 20-30                  | NP-10                    |
|                            | 4-10  | Clay loam, gravelly clay loam.                                           | CL             | A-6           | 0-10                            | 90-100                               | 65-90 | 60-80 | 50-65 | 35-40                  | 15-20                    |
|                            | 10-30 | Clay, gravelly clay.                                                     | CH, MH         | A-7           | 0-10                            | 90-100                               | 65-90 | 60-80 | 50-75 | 55-65                  | 25-35                    |
|                            | 30-34 | Unweathered bedrock.                                                     | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1422*:<br>Sumine-----      | 0-10  | Very cobbly loam                                                         | GM-GC          | A-2, A-4      | 30-55                           | 55-65                                | 50-60 | 40-55 | 30-45 | 20-30                  | 5-10                     |
|                            | 10-30 | Very gravelly clay loam, very cobbly clay loam, very gravelly loam.      | GC             | A-2, A-6, A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45                  | 15-25                    |
|                            | 30-34 | Unweathered bedrock.                                                     | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Hapgood-----               | 0-17  | Very gravelly loam.                                                      | GM-GC          | A-2           | 5-10                            | 50-60                                | 35-50 | 30-45 | 25-35 | 25-30                  | 5-10                     |
|                            | 17-40 | Very gravelly loam.                                                      | GC, GM-GC      | A-2           | 5-25                            | 50-60                                | 35-50 | 30-40 | 20-35 | 25-35                  | 5-15                     |
|                            | 40-60 | Very cobbly loam, very gravelly loam.                                    | GC, GM-GC      | A-2           | 15-40                           | 55-65                                | 50-60 | 35-45 | 25-35 | 25-35                  | 5-15                     |
| Cleavage-----              | 0-4   | Extremely gravelly loam.                                                 | GM-GC          | A-2           | 0-10                            | 35-45                                | 15-25 | 10-25 | 10-20 | 25-30                  | 5-10                     |
|                            | 4-15  | Very cobbly clay loam, extremely gravelly clay loam, very gravelly loam. | GC             | A-2           | 0-45                            | 40-55                                | 30-45 | 25-45 | 20-35 | 30-45                  | 10-20                    |
|                            | 15-19 | Unweathered bedrock.                                                     | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1423*:<br>Sumine-----      | 0-10  | Very cobbly loam                                                         | GM-GC          | A-2, A-4      | 30-55                           | 55-65                                | 50-60 | 40-55 | 30-45 | 20-30                  | 5-10                     |
|                            | 10-30 | Very gravelly clay loam, very cobbly clay loam, very gravelly loam.      | GC             | A-2, A-6, A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45                  | 15-25                    |
|                            | 30-34 | Unweathered bedrock.                                                     | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                          | Classification |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------|----------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                       | Unified        | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                       |                |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 1423*:<br>Chen-----         | 0-7   | Very gravelly<br>loam.                                                                | GC             | A-2              | 0-15                            | 50-65                                | 35-50 | 30-45 | 25-35 | 30-35           | 10-15                    |
|                             | 7-15  | Very gravelly<br>clay, extremely<br>gravelly clay,<br>very cobbly<br>clay.            | GC             | A-2, A-7         | 0-45                            | 35-50                                | 25-45 | 25-45 | 20-40 | 50-60           | 25-35                    |
|                             | 15    | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Rock outcrop.               |       |                                                                                       |                |                  |                                 |                                      |       |       |       |                 |                          |
| 1425*:<br>Sumine-----       | 0-10  | Very gravelly<br>loam.                                                                | GM-GC          | A-2, A-4         | 10-15                           | 50-65                                | 45-60 | 40-50 | 30-40 | 20-30           | 5-10                     |
|                             | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.       | GC             | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45           | 15-25                    |
|                             | 30-34 | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Loncan-----                 | 0-14  | Very gravelly<br>very fine sandy<br>loam.                                             | GM, GM-GC      | A-1, A-2         | 0-15                            | 40-60                                | 30-45 | 25-45 | 15-25 | 20-30           | NP-10                    |
|                             | 14-31 | Very gravelly<br>loam, extremely<br>cobbly loam,<br>very gravelly<br>sandy clay loam. | GC             | A-2              | 10-55                           | 35-60                                | 30-50 | 25-40 | 20-35 | 30-35           | 10-15                    |
|                             | 31    | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 1426*:<br>Sumine-----       | 0-10  | Gravelly loam----                                                                     | GM, SM         | A-2, A-4         | 0                               | 55-80                                | 50-75 | 35-70 | 25-50 | 20-25           | NP-5                     |
|                             | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.       | GC             | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45           | 15-25                    |
|                             | 30-34 | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Cleavage-----               | 0-4   | Extremely<br>gravelly loam.                                                           | GM-GC          | A-2              | 0-10                            | 35-45                                | 15-25 | 10-25 | 10-20 | 25-30           | 5-10                     |
|                             | 4-15  | Very cobbly clay<br>loam, extremely<br>gravelly clay<br>loam, very<br>gravelly loam.  | GC             | A-2              | 0-45                            | 40-55                                | 30-45 | 25-45 | 20-35 | 30-45           | 10-20                    |
|                             | 15-19 | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol   | Depth | USDA texture                                                                          | Classification |                  | Frag-<br>ments<br>> 3<br>inches<br>Pct | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-------------------------------|-------|---------------------------------------------------------------------------------------|----------------|------------------|----------------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                               |       |                                                                                       | Unified        | AASHTO           |                                        | 4                                    | 10    | 40    | 200   |                        |                          |
| 1426*:<br>Loncan-----         | In    |                                                                                       |                |                  |                                        |                                      |       |       |       |                        |                          |
|                               | 0-14  | Gravelly loam----                                                                     | GC, CL         | A-6              | 0-15                                   | 65-80                                | 60-75 | 50-70 | 35-60 | 30-35                  | 10-15                    |
|                               | 14-31 | Very gravelly<br>loam, extremely<br>cobbly loam,<br>very gravelly<br>sandy clay loam. | GC             | A-2              | 10-55                                  | 35-60                                | 30-50 | 25-40 | 20-35 | 30-35                  | 10-15                    |
|                               | 31    | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                                    | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1427*:<br>Sumine-----         |       |                                                                                       |                |                  |                                        |                                      |       |       |       |                        |                          |
|                               | 0-10  | Very gravelly<br>loam.                                                                | GM-GC          | A-2, A-4         | 10-15                                  | 50-65                                | 45-60 | 40-50 | 30-40 | 20-30                  | 5-10                     |
|                               | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.       | GC             | A-2, A-6,<br>A-7 | 15-40                                  | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45                  | 15-25                    |
|                               | 30-34 | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                                    | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Itca-----                     |       |                                                                                       |                |                  |                                        |                                      |       |       |       |                        |                          |
|                               | 0-9   | Very cobbly loam                                                                      | GM-GC, GC      | A-4, A-6         | 30-50                                  | 60-75                                | 50-65 | 45-60 | 35-50 | 25-35                  | 5-15                     |
|                               | 9-17  | Very cobbly clay<br>loam, very<br>gravelly clay,<br>extremely<br>gravelly clay.       | CL, GC         | A-7, A-2         | 0-55                                   | 40-80                                | 30-75 | 25-70 | 20-60 | 40-50                  | 15-25                    |
|                               | 17-21 | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                                    | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Softscrabble----              |       |                                                                                       |                |                  |                                        |                                      |       |       |       |                        |                          |
|                               | 0-16  | Gravelly loam----                                                                     | SM-SC          | A-4              | 0-5                                    | 70-85                                | 55-70 | 45-60 | 35-50 | 20-30                  | 5-10                     |
|                               | 16-30 | Very cobbly clay<br>loam.                                                             | GC             | A-6, A-7         | 30-45                                  | 60-75                                | 50-65 | 45-60 | 35-50 | 35-45                  | 15-20                    |
|                               | 30-60 | Gravelly clay<br>loam.                                                                | GC, CL         | A-6, A-7         | 5-10                                   | 65-80                                | 55-70 | 50-65 | 40-55 | 35-45                  | 15-20                    |
| 1428*:<br>Sumine-----         |       |                                                                                       |                |                  |                                        |                                      |       |       |       |                        |                          |
|                               | 0-10  | Very gravelly<br>loam.                                                                | GM-GC          | A-2, A-4         | 10-15                                  | 50-65                                | 45-60 | 40-50 | 30-40 | 20-30                  | 5-10                     |
|                               | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.       | GC             | A-2, A-6,<br>A-7 | 15-40                                  | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45                  | 15-25                    |
|                               | 30-34 | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                                    | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Rubble land.<br>Cleavage----- |       |                                                                                       |                |                  |                                        |                                      |       |       |       |                        |                          |
|                               | 0-4   | Extremely<br>gravelly loam.                                                           | GM-GC          | A-2              | 0-10                                   | 35-45                                | 15-25 | 10-25 | 10-20 | 25-30                  | 5-10                     |
|                               | 4-15  | Very cobbly clay<br>loam, extremely<br>gravelly clay<br>loam, very<br>gravelly loam.  | GC             | A-2              | 0-45                                   | 40-55                                | 30-45 | 25-45 | 20-35 | 30-45                  | 10-20                    |
|                               | 15-19 | Unweathered<br>bedrock.                                                               | ---            | ---              | ---                                    | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol   | Depth | USDA texture                                                        | Classification |               | Frag-ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|----------------------------|-------|---------------------------------------------------------------------|----------------|---------------|-----------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                            |       |                                                                     | Unified        | AASHTO        |                             | 4                                    | 10    | 40    | 200   |                 |                          |
|                            | In    |                                                                     |                |               | Pct                         |                                      |       |       |       | Pct             |                          |
| 1429*:<br>Sumine-----      | 0-10  | Very gravelly loam.                                                 | GM-GC          | A-2, A-4      | 10-15                       | 50-65                                | 45-60 | 40-50 | 30-40 | 20-30           | 5-10                     |
|                            | 10-30 | Very gravelly clay loam, very cobbly clay loam, very gravelly loam. | GC             | A-2, A-6, A-7 | 15-40                       | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45           | 15-25                    |
|                            | 30-34 | Unweathered bedrock.                                                | ---            | ---           | ---                         | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Winada Variant--           | 0-7   | Very gravelly fine sandy loam.                                      | GM-GC          | A-2           | 5-10                        | 45-60                                | 30-45 | 25-40 | 10-25 | 15-25           | 5-10                     |
|                            | 7-24  | Very gravelly sandy clay loam.                                      | GC             | A-2           | 5-10                        | 45-60                                | 30-45 | 25-40 | 20-35 | 30-40           | 10-15                    |
|                            | 24-45 | Extremely gravelly loam.                                            | GC             | A-2           | 5-15                        | 30-45                                | 15-25 | 15-25 | 10-20 | 25-35           | 10-15                    |
|                            | 45    | Unweathered bedrock.                                                | ---            | ---           | ---                         | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Pernty-----                | 0-3   | Very gravelly sandy loam.                                           | GM, GM-GC      | A-1, A-2      | 0-10                        | 40-60                                | 35-50 | 20-30 | 15-25 | 15-30           | NP-10                    |
|                            | 3-14  | Very cobbly clay loam, very gravelly clay loam, very gravelly loam. | GC             | A-6, A-7      | 10-30                       | 50-60                                | 45-55 | 40-50 | 35-45 | 35-45           | 15-20                    |
|                            | 14-18 | Unweathered bedrock.                                                | ---            | ---           | ---                         | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 1450*:<br>Atlow, steep---- | 0-3   | Very gravelly loam.                                                 | GC, SC         | A-2, A-6      | 0-15                        | 35-85                                | 30-50 | 20-45 | 15-40 | 25-35           | 10-15                    |
|                            | 3-14  | Very gravelly clay loam, very cobbly clay loam.                     | GC             | A-2, A-6, A-7 | 0-45                        | 35-60                                | 25-50 | 20-50 | 15-40 | 35-45           | 15-20                    |
|                            | 14-18 | Unweathered bedrock.                                                | ---            | ---           | ---                         | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Atlow-----                 | 0-3   | Very gravelly loam.                                                 | GC, SC         | A-2, A-6      | 0-15                        | 35-85                                | 30-50 | 20-45 | 15-40 | 25-35           | 10-15                    |
|                            | 3-14  | Very gravelly clay loam, very cobbly clay loam.                     | GC             | A-2, A-6, A-7 | 0-45                        | 35-60                                | 25-50 | 20-50 | 15-40 | 35-45           | 15-20                    |
|                            | 14-18 | Unweathered bedrock.                                                | ---            | ---           | ---                         | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Stingdorn-----             | 0-7   | Cobbly loam-----                                                    | SM-SC          | A-4           | 25-40                       | 85-95                                | 75-90 | 55-80 | 40-50 | 20-30           | 5-10                     |
|                            | 7-15  | Very cobbly clay loam.                                              | GC             | A-6           | 30-50                       | 60-75                                | 50-65 | 45-60 | 35-50 | 35-40           | 15-20                    |
|                            | 15-20 | Indurated-----                                                      | ---            | ---           | ---                         | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                            | 20    | Unweathered bedrock.                                                | ---            | ---           | ---                         | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                       | Classification       |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|----------------------------------------------------|----------------------|---------------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                          |       |                                                    | Unified              | AASHTO        |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                          | In    |                                                    |                      |               | Pct                             |                                      |       |       |       | Pct                    |                          |
| 1451*:<br>Atlow-----     | 0-3   | Very gravelly loam.                                | GC, SC               | A-2, A-6      | 0-15                            | 35-85                                | 30-50 | 20-45 | 15-40 | 25-35                  | 10-15                    |
|                          | 3-14  | Very gravelly clay loam, very cobbly clay loam.    | GC                   | A-2, A-6, A-7 | 0-45                            | 35-60                                | 25-50 | 20-50 | 15-40 | 35-45                  | 15-20                    |
|                          | 14-18 | Unweathered bedrock.                               | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Reluctan-----            | 0-8   | Cobbly loam-----                                   | SM-SC, CL-ML         | A-4           | 15-30                           | 80-90                                | 70-90 | 60-85 | 40-70 | 20-30                  | 5-10                     |
|                          | 8-33  | Gravelly loam, gravelly clay loam.                 | GC, CL               | A-6, A-7      | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45                  | 15-20                    |
|                          | 33-37 | Unweathered bedrock.                               | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Trunk-----               | 0-5   | Very cobbly loam                                   | GM-GC, SM-SC, SC, GC | A-4, A-6      | 30-45                           | 55-80                                | 50-75 | 45-70 | 35-50 | 25-35                  | 5-15                     |
|                          | 5-28  | Gravelly clay, gravelly clay loam.                 | CL, GC, CH           | A-7           | 0-10                            | 55-85                                | 50-80 | 45-75 | 40-65 | 40-55                  | 20-30                    |
|                          | 28-32 | Unweathered bedrock.                               | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1452*:<br>Atlow-----     | 0-3   | Gravelly loam-----                                 | CL, SC, GC           | A-6           | 0-10                            | 65-90                                | 55-75 | 45-70 | 35-60 | 25-35                  | 10-15                    |
|                          | 3-14  | Very gravelly clay loam, very cobbly clay loam.    | GC                   | A-2, A-6, A-7 | 0-45                            | 35-60                                | 25-50 | 20-50 | 15-40 | 35-45                  | 15-20                    |
|                          | 14-18 | Unweathered bedrock.                               | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Minat-----               | 0-9   | Very gravelly loam.                                | GM-GC, GC            | A-2           | 5-10                            | 45-60                                | 35-50 | 30-45 | 20-35 | 25-35                  | 5-15                     |
|                          | 9-27  | Very gravelly loam.                                | GC, GM-GC            | A-2           | 0-10                            | 45-60                                | 30-50 | 25-45 | 20-35 | 25-35                  | 5-15                     |
|                          | 27-60 | Very gravelly loam, very gravelly fine sandy loam. | GM-GC, GC            | A-2           | 0-10                            | 45-60                                | 30-50 | 20-45 | 15-30 | 25-35                  | 5-15                     |
| Old Camp-----            | 0-3   | Very cobbly loam                                   | GM-GC, GC, SM-SC, SC | A-2, A-4, A-6 | 35-50                           | 60-75                                | 50-65 | 45-60 | 30-45 | 25-35                  | 5-15                     |
|                          | 3-15  | Very cobbly clay loam.                             | GC, SC               | A-2, A-6      | 35-50                           | 60-75                                | 50-65 | 45-60 | 30-45 | 35-40                  | 15-20                    |
|                          | 15    | Unweathered bedrock.                               | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1453*:<br>Atlow-----     | 0-3   | Very gravelly loam.                                | GC, SC               | A-2, A-6      | 0-15                            | 35-85                                | 30-50 | 20-45 | 15-40 | 25-35                  | 10-15                    |
|                          | 3-14  | Very gravelly clay loam, very cobbly clay loam.    | GC                   | A-2, A-6, A-7 | 0-45                            | 35-60                                | 25-50 | 20-50 | 15-40 | 35-45                  | 15-20                    |
|                          | 14-18 | Unweathered bedrock.                               | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                       | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|----------------------------------------------------------------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                                    | Unified                 | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                                    |                         |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 1453*:<br>Colbar-----       | 0-3   | Gravelly loam----                                                                                  | SM-SC, SM,<br>GM, GM-GC | A-4              | 0-5                             | 65-85                                | 60-75 | 50-65 | 35-50 | 20-30           | NP-10                    |
|                             | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                                        | CL                      | A-6              | 10-35                           | 75-90                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                             | 22-26 | Gravelly loam,<br>cobbly loam.                                                                     | SM-SC,<br>CL-ML         | A-4              | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                             | 26-30 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Rock outcrop.               |       |                                                                                                    |                         |                  |                                 |                                      |       |       |       |                 |                          |
| 1532*:<br>Cleavage-----     | 0-4   | Very gravelly<br>fine sandy loam.                                                                  | GM, SM                  | A-1              | 0-10                            | 50-70                                | 30-50 | 20-45 | 15-25 | 20-25           | NP-5                     |
|                             | 4-15  | Very cobbly clay<br>loam, extremely<br>gravelly clay<br>loam, very<br>gravelly loam.               | GC                      | A-2              | 0-45                            | 40-55                                | 30-45 | 25-45 | 20-35 | 30-45           | 10-20                    |
|                             | 15-19 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Rubble land.                |       |                                                                                                    |                         |                  |                                 |                                      |       |       |       |                 |                          |
| Bregar-----                 | 0-4   | Very gravelly<br>fine sandy loam.                                                                  | GM-GC, GM               | A-1, A-2         | 10-20                           | 45-60                                | 40-55 | 35-50 | 15-30 | 15-25           | NP-10                    |
|                             | 4-11  | Very gravelly<br>clay loam,<br>extremely<br>gravelly loam,<br>extremely cobbly<br>sandy clay loam. | GC                      | A-2              | 0-40                            | 25-45                                | 20-35 | 15-30 | 15-25 | 35-45           | 15-25                    |
|                             | 11-15 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 1542*:<br>Linrose-----      | 0-8   | Gravelly loam----                                                                                  | ML, GM                  | A-4              | 0-10                            | 65-85                                | 55-75 | 50-70 | 35-60 | 15-25           | NP-5                     |
|                             | 8-26  | Very gravelly<br>loam, very<br>gravelly sandy<br>loam.                                             | GC, GM-GC               | A-2              | 0-15                            | 40-60                                | 30-50 | 25-45 | 15-35 | 25-35           | 5-15                     |
|                             | 26    | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Cleavage-----               | 0-4   | Very gravelly<br>loam.                                                                             | GM-GC, GC               | A-2, A-4,<br>A-6 | 0-10                            | 50-70                                | 30-50 | 25-45 | 20-40 | 25-35           | 5-15                     |
|                             | 4-15  | Very cobbly clay<br>loam, extremely<br>gravelly clay<br>loam, very<br>gravelly loam.               | GC                      | A-2              | 0-45                            | 40-55                                | 30-45 | 25-45 | 20-35 | 30-45           | 10-20                    |
|                             | 15-19 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                       | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                    | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                             | In    |                                                                                    |                         |          | Pct                             |                                      |       |       |       |                        |                          |
| 1542*:<br>Pernty-----       | 0-3   | Very gravelly<br>loam.                                                             | GC                      | A-2      | 0-10                            | 40-55                                | 35-50 | 25-35 | 20-30 | 30-35                  | 10-15                    |
|                             | 3-14  | Very cobbly clay<br>loam, very<br>gravelly clay<br>loam, very<br>gravelly loam.    | GC                      | A-6, A-7 | 10-30                           | 50-60                                | 45-55 | 40-50 | 35-45 | 35-45                  | 15-20                    |
|                             | 14-18 | Unweathered<br>bedrock.                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 1570*:<br>Koynik Variant--  | 0-5   | Very gravelly<br>sandy loam.                                                       | GM                      | A-1, A-2 | 25-50                           | 50-65                                | 35-50 | 25-45 | 20-35 | 15-25                  | NP-5                     |
|                             | 5-13  | Very gravelly<br>fine sandy loam,<br>very gravelly<br>sandy loam.                  | GM                      | A-1      | 0-25                            | 40-55                                | 35-50 | 25-45 | 10-20 | 15-25                  | NP-5                     |
|                             | 13    | Unweathered<br>bedrock.                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Oxcorel-----                | 0-8   | Cobbly very fine<br>sandy loam.                                                    | SM                      | A-4      | 15-30                           | 65-85                                | 60-80 | 55-75 | 35-50 | 15-25                  | NP-5                     |
|                             | 8-34  | Clay, clay loam                                                                    | CL, CH                  | A-7      | 0                               | 85-95                                | 80-90 | 65-85 | 60-80 | 40-55                  | 20-30                    |
|                             | 34-60 | Very gravelly<br>loam, very<br>gravelly sandy<br>loam.                             | GM                      | A-1      | 0-15                            | 30-60                                | 25-50 | 20-40 | 15-25 | 15-25                  | NP-5                     |
| Whirlo-----                 | 0-7   | Cobbly very fine<br>sandy loam.                                                    | SM, ML                  | A-4      | 15-25                           | 80-95                                | 75-90 | 70-80 | 40-55 | 15-25                  | NP-5                     |
|                             | 7-13  | Gravelly sandy<br>loam, gravelly<br>loam, fine sandy<br>loam.                      | SM, GM, ML              | A-2, A-4 | 0-10                            | 60-95                                | 55-85 | 40-60 | 25-55 | 15-25                  | NP-5                     |
|                             | 13-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam. | GM                      | A-1, A-2 | 5-30                            | 45-60                                | 25-50 | 20-40 | 10-30 | 15-25                  | NP-5                     |
| 1600*.<br>Dumps             |       |                                                                                    |                         |          |                                 |                                      |       |       |       |                        |                          |
| 1601*.<br>Pits              |       |                                                                                    |                         |          |                                 |                                      |       |       |       |                        |                          |
| 1662*:<br>Floer-----        | 0-12  | Gravelly silt<br>loam.                                                             | GM, GM-GC,<br>SM, SM-SC | A-4      | 0-10                            | 55-80                                | 50-75 | 40-70 | 35-50 | 20-30                  | NP-10                    |
|                             | 12-50 | Very cobbly clay,<br>extremely stony<br>clay.                                      | GC                      | A-2      | 45-55                           | 45-65                                | 35-55 | 30-40 | 25-35 | 55-65                  | 30-40                    |
|                             | 50-54 | Unweathered<br>bedrock.                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                            | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                                         | Unified         | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                             | In    |                                                                                                         |                 |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 1662*:<br>Slaven-----       | 0-5   | Loam-----                                                                                               | CL              | A-6      | 5-10                            | 85-95                                | 75-90  | 65-80 | 55-70 | 25-35           | 10-15                    |
|                             | 5-22  | Extremely<br>gravelly clay,<br>extremely<br>gravelly sandy<br>clay, extremely<br>gravelly clay<br>loam. | GC              | A-2      | 0                               | 25-35                                | 15-25  | 15-20 | 10-20 | 40-50           | 15-25                    |
|                             | 22    | Unweathered<br>bedrock.                                                                                 | ---             | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Roca-----                   | 0-5   | Very gravelly<br>loam.                                                                                  | GC              | A-2      | 0-10                            | 35-60                                | 30-50  | 25-40 | 20-35 | 25-35           | 10-15                    |
|                             | 5-27  | Very gravelly<br>clay loam, very<br>gravelly clay.                                                      | GC, SC          | A-2      | 0-15                            | 60-75                                | 40-50  | 30-45 | 25-35 | 45-60           | 25-35                    |
|                             | 27-31 | Unweathered<br>bedrock.                                                                                 | ---             | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 1670*:<br>Wieland-----      | 0-8   | Loam-----                                                                                               | CL-ML, ML       | A-4      | 0                               | 90-100                               | 75-100 | 70-90 | 50-75 | 20-30           | NP-10                    |
|                             | 8-20  | Gravelly clay---                                                                                        | CH, SC          | A-7      | 0-5                             | 75-95                                | 55-75  | 50-70 | 45-65 | 50-60           | 25-35                    |
|                             | 20-60 | Loam, gravelly<br>loam, gravelly<br>sandy loam.                                                         | CL-ML,<br>SM-SC | A-4, A-2 | 0-5                             | 65-95                                | 55-90  | 40-85 | 25-70 | 20-30           | 5-10                     |
| Allor-----                  | 0-12  | Very cobbly loam                                                                                        | SM-SC,<br>GM-GC | A-2, A-4 | 30-50                           | 60-75                                | 45-70  | 40-65 | 30-45 | 20-30           | 5-10                     |
|                             | 12-34 | Gravelly clay<br>loam, gravelly<br>sandy clay loam.                                                     | SC              | A-6, A-7 | 0-10                            | 70-85                                | 55-75  | 45-65 | 35-50 | 35-45           | 15-20                    |
|                             | 34-60 | Gravelly loamy<br>sand, very<br>gravelly loamy<br>sand.                                                 | SM              | A-1      | 0-10                            | 55-75                                | 45-65  | 30-50 | 10-20 | ---             | NP                       |
| 1671*:<br>Wieland-----      | 0-8   | Loam-----                                                                                               | CL-ML, ML       | A-4      | 0                               | 90-100                               | 75-100 | 70-90 | 50-75 | 20-30           | NP-10                    |
|                             | 8-20  | Gravelly clay---                                                                                        | CH, SC          | A-7      | 0-5                             | 75-95                                | 55-75  | 50-70 | 45-65 | 50-60           | 25-35                    |
|                             | 20-60 | Loam, gravelly<br>loam, gravelly<br>sandy loam.                                                         | CL-ML,<br>SM-SC | A-4, A-2 | 0-5                             | 65-95                                | 55-90  | 40-85 | 25-70 | 20-30           | 5-10                     |
| Oxcorel-----                | 0-5   | Gravelly fine<br>sandy loam.                                                                            | SM-SC,<br>GM-GC | A-2, A-4 | 0-10                            | 60-85                                | 55-75  | 40-60 | 25-40 | 25-30           | 5-10                     |
|                             | 5-20  | Clay, clay loam                                                                                         | CL, CH          | A-7      | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55           | 20-30                    |
|                             | 20-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                                     | GM              | A-1      | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25           | NP-5                     |
| Allor-----                  | 0-12  | Very cobbly loam                                                                                        | SM-SC,<br>GM-GC | A-2, A-4 | 30-50                           | 60-75                                | 45-70  | 40-65 | 30-45 | 20-30           | 5-10                     |
|                             | 12-34 | Gravelly clay<br>loam, gravelly<br>sandy clay loam.                                                     | SC              | A-6, A-7 | 0-10                            | 70-85                                | 55-75  | 45-65 | 35-50 | 35-45           | 15-20                    |
|                             | 34-60 | Gravelly loamy<br>sand, very<br>gravelly loamy<br>sand.                                                 | SM              | A-1      | 0-10                            | 55-75                                | 45-65  | 30-50 | 10-20 | ---             | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                        | Classification  |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------|-----------------|------------------|---------------------------------|--------------------------------------|--------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                     | Unified         | AASHTO           |                                 | 4                                    | 10     | 40    | 200   |                        |                          |
|                             | In    |                                                                                     |                 |                  | Pct                             |                                      |        |       |       | Pct                    |                          |
| 1673*:<br>Wieland-----      | 0-8   | Gravelly loam----                                                                   | GC, CL, SC      | A-6              | 0-5                             | 60-85                                | 50-75  | 45-70 | 35-60 | 25-35                  | 10-15                    |
|                             | 8-20  | Gravelly clay,<br>clay.                                                             | CH, SC          | A-7              | 0-5                             | 75-95                                | 55-90  | 50-80 | 45-75 | 50-60                  | 25-35                    |
|                             | 20-60 | Loam, gravelly<br>loam, gravelly<br>sandy loam.                                     | CL-ML,<br>SM-SC | A-4, A-2         | 0-5                             | 65-95                                | 55-90  | 40-85 | 25-70 | 20-30                  | 5-10                     |
| Grassval-----               | 0-4   | Gravelly loam----                                                                   | SM-SC           | A-2, A-4         | 0-5                             | 65-80                                | 55-70  | 45-60 | 30-45 | 20-25                  | 5-10                     |
|                             | 4-13  | Gravelly clay<br>loam, gravelly<br>loam.                                            | GC              | A-6              | 0-10                            | 65-75                                | 55-70  | 50-65 | 35-50 | 30-40                  | 15-20                    |
|                             | 13    | Indurated-----                                                                      | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Puett-----                  | 0-4   | Very gravelly<br>loam.                                                              | GM              | A-1, A-2         | 0-10                            | 50-60                                | 40-50  | 35-45 | 20-35 | 15-20                  | NP-5                     |
|                             | 4-15  | Coarse sandy<br>loam, gravelly<br>loam, sandy<br>loam.                              | SM, ML, GM      | A-1, A-2,<br>A-4 | 0                               | 55-95                                | 50-90  | 30-80 | 15-55 | ---                    | NP                       |
|                             | 15-19 | Weathered bedrock                                                                   | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| 1680-----<br>Zineb          | 0-11  | Gravelly loam----                                                                   | SM-SC,<br>CL-ML | A-4              | 0-10                            | 70-90                                | 55-75  | 50-70 | 35-55 | 20-30                  | 5-10                     |
|                             | 11-20 | Very gravelly<br>sandy loam.                                                        | SM-SC,<br>GM-GC | A-2              | 0-10                            | 40-65                                | 25-55  | 20-45 | 10-25 | 20-30                  | 5-10                     |
|                             | 20-45 | Extremely cobbly<br>loamy coarse<br>sand, extremely<br>cobbly coarse<br>sand.       | GP, GP-GM       | A-1              | 50-75                           | 20-50                                | 15-45  | 5-25  | 0-10  | ---                    | NP                       |
|                             | 45-60 | Loam-----                                                                           | ML              | A-4              | 0                               | 95-100                               | 90-100 | 65-85 | 55-70 | 15-25                  | NP-5                     |
| 1682*:<br>Zineb-----        | 0-11  | Gravelly loam----                                                                   | SM-SC,<br>CL-ML | A-4              | 0-10                            | 70-90                                | 55-75  | 50-70 | 35-55 | 20-30                  | 5-10                     |
|                             | 11-20 | Very gravelly<br>sandy loam.                                                        | SM-SC,<br>GM-GC | A-2              | 0-10                            | 40-65                                | 25-55  | 20-45 | 10-25 | 20-30                  | 5-10                     |
|                             | 20-45 | Extremely cobbly<br>loamy coarse<br>sand, extremely<br>cobbly coarse<br>sand.       | GP, GP-GM       | A-1              | 50-75                           | 20-50                                | 15-45  | 5-25  | 0-10  | ---                    | NP                       |
|                             | 45-60 | Loam-----                                                                           | ML              | A-4              | 0                               | 95-100                               | 90-100 | 65-85 | 55-70 | 15-25                  | NP-5                     |
| Doowak-----                 | 0-6   | Very gravelly<br>loamy sand.                                                        | GM, GP-GM       | A-1              | 5-10                            | 40-55                                | 30-45  | 15-30 | 5-15  | ---                    | NP                       |
|                             | 6-60  | Stratified<br>extremely<br>gravelly sand to<br>extremely<br>gravelly loamy<br>sand. | GP              | A-1              | 5-10                            | 30-45                                | 10-25  | 5-20  | 0-5   | ---                    | NP                       |
| Oxcorel-----                | 0-8   | Gravelly silt<br>loam.                                                              | SM-SC,<br>GM-GC | A-4              | 0-10                            | 60-85                                | 55-75  | 45-60 | 35-50 | 25-30                  | 5-10                     |
|                             | 8-34  | Clay, clay loam                                                                     | CL, CH          | A-7              | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                             | 34-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                 | GM              | A-1              | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25                  | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                           | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|------------------------|--------------------------|
|                          |       |                                                                        | Unified        | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                        |                          |
|                          | In    |                                                                        |                |          | Pct                             |                                      |        |       |       |                        |                          |
| 2060*:<br>Oxcorel-----   | 0-5   | Very fine sandy loam.                                                  | ML             | A-4      | 0-5                             | 90-100                               | 90-100 | 70-85 | 50-65 | 20-30                  | NP-5                     |
|                          | 5-34  | Clay, clay loam                                                        | CL, CH         | A-7      | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                          | 34-60 | Very gravelly sandy loam, very gravelly loam.                          | GM             | A-1      | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25                  | NP-5                     |
| Beoska-----              | 0-9   | Silt loam-----                                                         | ML             | A-4      | 0                               | 85-95                                | 75-85  | 70-80 | 55-70 | 30-35                  | NP-5                     |
|                          | 9-18  | Silt loam, silty clay loam.                                            | CL             | A-6, A-7 | 0                               | 80-100                               | 75-100 | 70-85 | 60-85 | 35-45                  | 15-25                    |
|                          | 18-60 | Stratified very gravelly very fine sandy loam to gravelly sandy loam.  | GM, SM         | A-1, A-2 | 0-10                            | 55-80                                | 50-75  | 30-50 | 20-35 | 15-25                  | NP-5                     |
| Whirlo-----              | 0-12  | Gravelly loam----                                                      | ML, GM         | A-4      | 0                               | 60-75                                | 55-75  | 50-70 | 40-60 | ---                    | NP                       |
|                          | 12-24 | Very gravelly fine sandy loam, very gravelly loam.                     | GM             | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40 | 15-35 | ---                    | NP                       |
|                          | 24-60 | Stratified very gravelly loam to extremely gravelly coarse sandy loam. | GW-GM, GP-GM   | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25 | 5-10  | ---                    | NP                       |
| 2061*:<br>Oxcorel-----   | 0-8   | Silt loam-----                                                         | ML             | A-4      | 0-5                             | 90-100                               | 90-100 | 70-85 | 50-65 | 20-30                  | NP-5                     |
|                          | 8-34  | Clay, clay loam                                                        | CL, CH         | A-7      | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                          | 34-60 | Very gravelly sandy loam, very gravelly loam.                          | GM             | A-1      | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25                  | NP-5                     |
| Whirlo-----              | 0-12  | Gravelly loam----                                                      | ML, GM         | A-4      | 0                               | 60-75                                | 55-75  | 50-70 | 40-60 | ---                    | NP                       |
|                          | 12-24 | Very gravelly fine sandy loam, very gravelly loam.                     | GM             | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40 | 15-35 | ---                    | NP                       |
|                          | 24-60 | Stratified very gravelly loam to extremely gravelly coarse sandy loam. | GW-GM, GP-GM   | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25 | 5-10  | ---                    | NP                       |
| Dun Glen-----            | 0-4   | Gravelly loam----                                                      | SM             | A-2, A-4 | 0                               | 70-80                                | 55-75  | 45-60 | 30-50 | 15-25                  | NP-5                     |
|                          | 4-60  | Fine sandy loam, very fine sandy loam.                                 | SM             | A-4      | 0                               | 90-100                               | 85-100 | 70-85 | 35-50 | 15-25                  | NP-5                     |
| 2062*:<br>Oxcorel-----   | 0-5   | Gravelly loam----                                                      | SM-SC, GM-GC   | A-4      | 0-10                            | 60-85                                | 55-75  | 45-60 | 35-50 | 25-30                  | 5-10                     |
|                          | 5-36  | Clay, clay loam                                                        | CL, CH         | A-7      | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                          | 36-60 | Very gravelly sandy loam, very gravelly loam.                          | GM             | A-1      | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25                  | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol          | Depth | USDA texture                                                                            | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------------------|-------|-----------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                                      |       |                                                                                         | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                                      | In    |                                                                                         |                         |          | Pct                             |                                      |       |       |       |                        |                          |
| 2062*:<br>Orovada-----               | 0-8   | Gravelly very<br>fine sandy loam.                                                       | GM, SM                  | A-2, A-4 | 0                               | 60-80                                | 55-75 | 45-70 | 30-50 | 15-25                  | NP-5                     |
|                                      | 8-20  | Fine sandy loam,<br>loam, very fine<br>sandy loam.                                      | SM, ML                  | A-4      | 0                               | 75-100                               | 75-95 | 60-85 | 40-70 | 20-30                  | NP-5                     |
|                                      | 20-60 | Stratified fine<br>sandy loam to<br>silt loam.                                          | SM, ML                  | A-4      | 0                               | 75-100                               | 75-95 | 60-85 | 35-55 | 20-30                  | NP-5                     |
| 2064*:<br>Oxcorel-----               | 0-5   | Gravelly very<br>fine sandy loam.                                                       | SM, GM                  | A-4      | 0-10                            | 60-85                                | 55-75 | 45-70 | 35-50 | 15-25                  | NP-5                     |
|                                      | 5-20  | Clay, clay loam                                                                         | CL, CH                  | A-7      | 0-5                             | 85-95                                | 80-90 | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                                      | 20-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                     | GM                      | A-1      | 0-15                            | 30-60                                | 25-50 | 20-40 | 15-25 | 15-25                  | NP-5                     |
| Misad-----                           | 0-7   | Gravelly fine<br>sandy loam.                                                            | SM, SM-SC               | A-1, A-2 | 0-5                             | 65-80                                | 55-70 | 45-60 | 20-35 | 15-25                  | NP-10                    |
|                                      | 7-31  | Stratified fine<br>sandy loam to<br>very gravelly<br>sandy loam.                        | GM, GM-GC,<br>SM, SM-SC | A-1, A-2 | 5-10                            | 45-65                                | 40-60 | 25-40 | 10-25 | 15-25                  | NP-10                    |
|                                      | 31-60 | Stratified very<br>gravelly loamy<br>sand to<br>extremely<br>gravelly coarse<br>sand.   | GP-GM                   | A-1      | 5-10                            | 40-55                                | 20-40 | 10-30 | 5-10  | ---                    | NP                       |
| 2065*:<br>Oxcorel-----               | 0-5   | Gravelly loam----                                                                       | SM-SC,<br>GM-GC         | A-4      | 0-10                            | 60-85                                | 55-75 | 45-60 | 35-50 | 25-30                  | 5-10                     |
|                                      | 5-36  | Clay, clay loam                                                                         | CL, CH                  | A-7      | 0-5                             | 85-95                                | 80-90 | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                                      | 36-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                     | GM                      | A-1      | 0-15                            | 30-60                                | 25-50 | 20-40 | 15-25 | 15-25                  | NP-5                     |
| Oxcorel,<br>moderately<br>steep----- | 0-3   | Gravelly loam----                                                                       | SM-SC,<br>GM-GC         | A-4      | 0-10                            | 60-85                                | 55-75 | 45-60 | 35-50 | 25-30                  | 5-10                     |
|                                      | 3-30  | Clay, clay loam                                                                         | CL, CH                  | A-7      | 0-5                             | 85-95                                | 80-90 | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                                      | 30-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                     | GM                      | A-1      | 0-15                            | 30-60                                | 25-50 | 20-40 | 15-25 | 15-25                  | NP-5                     |
| Pineval-----                         | 0-5   | Gravelly loam----                                                                       | CL-ML,<br>GM-GC         | A-4      | 0                               | 65-85                                | 60-75 | 45-65 | 40-55 | 20-30                  | 5-10                     |
|                                      | 5-11  | Very gravelly<br>clay loam, very<br>gravelly loam,<br>very gravelly<br>sandy clay loam. | GC                      | A-2      | 0                               | 35-60                                | 25-50 | 20-40 | 15-35 | 30-40                  | 10-15                    |
|                                      | 11-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly sand.             | GP-GM, GM               | A-1      | 0-25                            | 30-60                                | 20-50 | 15-40 | 5-20  | ---                    | NP                       |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                       | Classification |        | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|----------------------------------------------------|----------------|--------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                             |       |                                                    | Unified        | AASHTO |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                             | In    |                                                    |                |        | Pct                             |                                      |        |       |       | Pct             |                          |
| 2066*:<br>Oxcorel-----      | 0-9   | Very fine sandy loam.                              | ML             | A-4    | 0-5                             | 90-100                               | 90-100 | 70-85 | 50-65 | 20-30           | NP-5                     |
|                             | 9-36  | Clay, clay loam                                    | CL, CH         | A-7    | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55           | 20-30                    |
|                             | 36-60 | Very gravelly sandy loam, very gravelly loam.      | GM             | A-1    | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25           | NP-5                     |
| Broyles-----                | 0-11  | Very fine sandy loam.                              | ML             | A-4    | 0                               | 100                                  | 95-100 | 85-95 | 60-75 | ---             | NP                       |
|                             | 11-60 | Stratified loam to gravelly loamy sand.            | SM             | A-2    | 0                               | 70-100                               | 60-95  | 30-40 | 25-35 | ---             | NP                       |
| Dun Glen-----               | 0-4   | Very fine sandy loam.                              | ML             | A-4    | 0                               | 95-100                               | 90-100 | 80-95 | 50-65 | 15-25           | NP-5                     |
|                             | 4-60  | Fine sandy loam, very fine sandy loam.             | SM             | A-4    | 0                               | 90-100                               | 85-100 | 70-85 | 35-50 | 15-25           | NP-5                     |
| 2067*:<br>Oxcorel-----      | 0-8   | Very fine sandy loam.                              | ML             | A-4    | 0-5                             | 90-100                               | 90-100 | 70-85 | 50-65 | 20-30           | NP-5                     |
|                             | 8-34  | Clay, clay loam                                    | CL, CH         | A-7    | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55           | 20-30                    |
|                             | 34-60 | Very gravelly sandy loam, very gravelly loam.      | GM             | A-1    | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25           | NP-5                     |
| Colbar-----                 | 0-3   | Cobbly loam-----                                   | CL-ML          | A-4    | 35-45                           | 90-100                               | 85-95  | 75-85 | 50-60 | 20-30           | 5-10                     |
|                             | 3-22  | Cobbly loam, gravelly clay loam, cobbly clay loam. | CL             | A-6    | 10-35                           | 90-95                                | 70-85  | 60-80 | 50-65 | 30-40           | 10-20                    |
|                             | 22-26 | Gravelly loam, cobbly loam.                        | SM-SC, CL-ML   | A-4    | 5-30                            | 75-95                                | 60-90  | 55-75 | 35-55 | 20-30           | 5-10                     |
|                             | 26-30 | Unweathered bedrock.                               | ---            | ---    | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Stingdorn-----              | 0-7   | Cobbly loam-----                                   | SM-SC          | A-4    | 25-40                           | 85-95                                | 75-90  | 55-80 | 40-50 | 20-30           | 5-10                     |
|                             | 7-15  | Very cobbly clay loam.                             | GC             | A-6    | 30-50                           | 60-75                                | 50-65  | 45-60 | 35-50 | 35-40           | 15-20                    |
|                             | 15-20 | Indurated-----                                     | ---            | ---    | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                             | 20    | Unweathered bedrock.                               | ---            | ---    | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 2068*:<br>Oxcorel-----      | 0-5   | Gravelly very fine sandy loam.                     | SM, GM         | A-4    | 0-10                            | 60-85                                | 55-75  | 45-70 | 35-50 | 15-25           | NP-5                     |
|                             | 5-36  | Clay, clay loam                                    | CL, CH         | A-7    | 0-5                             | 85-95                                | 80-90  | 75-85 | 65-80 | 40-55           | 20-30                    |
|                             | 36-60 | Very gravelly sandy loam, very gravelly loam.      | GM             | A-1    | 0-15                            | 30-60                                | 25-50  | 20-40 | 15-25 | 15-25           | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                     | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|--------------------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                                  | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                             | In    |                                                                                                  |                         |          | Pct                             |                                      |       |       |       |                        |                          |
| 2068*:<br>Golconda-----     | 0-10  | Gravelly very<br>fine sandy loam.                                                                | GM-GC                   | A-4      | 0-10                            | 65-75                                | 55-65 | 45-65 | 35-50 | 20-30                  | 5-10                     |
|                             | 10-23 | Gravelly clay<br>loam, clay loam,<br>silty clay loam.                                            | GC, CL                  | A-6, A-7 | 0                               | 60-95                                | 55-90 | 50-90 | 40-70 | 35-45                  | 15-20                    |
|                             | 23-36 | Cemented-----                                                                                    | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                             | 36-60 | Very gravelly<br>loamy coarse<br>sand, very<br>gravelly sandy<br>loam.                           | GP-GM, GM               | A-1      | 0                               | 30-55                                | 25-50 | 10-40 | 5-20  | ---                    | NP                       |
| Whirlo-----                 | 0-12  | Gravelly very<br>fine sandy loam.                                                                | ML, GM                  | A-4      | 0                               | 60-75                                | 55-75 | 50-70 | 40-60 | ---                    | NP                       |
|                             | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                                      | GM                      | A-1, A-2 | 0-5                             | 45-55                                | 35-50 | 30-40 | 15-35 | ---                    | NP                       |
|                             | 24-60 | Stratified very<br>gravelly loam to<br>extremely<br>gravelly coarse<br>sandy loam.               | GW-GM,<br>GP-GM         | A-1      | 0-5                             | 40-50                                | 20-35 | 10-25 | 5-10  | ---                    | NP                       |
| 2069*:<br>Oxcorel-----      | 0-5   | Gravelly silt<br>loam.                                                                           | SM-SC,<br>GM-GC         | A-4      | 0-10                            | 60-85                                | 55-75 | 45-60 | 35-50 | 25-30                  | 5-10                     |
|                             | 5-20  | Clay, clay loam                                                                                  | CL, CH                  | A-7      | 0-5                             | 85-95                                | 80-90 | 75-85 | 65-80 | 40-55                  | 20-30                    |
|                             | 20-60 | Very gravelly<br>sandy loam, very<br>gravelly loam.                                              | GM                      | A-1      | 0-15                            | 30-60                                | 25-50 | 20-40 | 15-25 | 15-25                  | NP-5                     |
| Rednik-----                 | 0-5   | Very gravelly<br>sandy loam.                                                                     | GM                      | A-1      | 0-5                             | 45-55                                | 35-50 | 25-40 | 15-25 | ---                    | NP                       |
|                             | 5-16  | Very gravelly<br>sandy loam,<br>extremely<br>gravelly loam,<br>very gravelly<br>sandy clay loam. | GC                      | A-2      | 5-30                            | 35-60                                | 30-50 | 20-35 | 15-30 | 25-35                  | 10-15                    |
|                             | 16-47 | Very gravelly<br>sandy loam, very<br>gravelly fine<br>sandy loam.                                | GM                      | A-1      | 5-30                            | 35-60                                | 30-50 | 15-40 | 10-25 | ---                    | NP                       |
|                             | 47-60 | Very gravelly<br>sand, extremely<br>gravelly loamy<br>sand.                                      | GP, GP-GM,<br>SP-SM, GM | A-1      | 5-30                            | 30-60                                | 25-60 | 15-30 | 0-15  | ---                    | NP                       |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                       | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                                    | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                          | In    |                                                                                    |                         |          | Pct                             |                                      |       |       |       | Pct             |                          |
| 2069*:<br>Veta-----      | 0-4   | Very gravelly<br>fine sandy loam.                                                  | GM                      | A-1      | 0-5                             | 45-60                                | 35-50 | 30-45 | 10-25 | ---             | NP                       |
|                          | 4-20  | Extremely<br>gravelly loam,<br>very gravelly<br>sandy loam, very<br>gravelly loam. | GM                      | A-1, A-2 | 10-30                           | 40-55                                | 30-50 | 20-40 | 15-30 | ---             | NP                       |
|                          | 20-60 | Stratified<br>extremely<br>gravelly loamy<br>sand to very<br>gravelly loam.        | GP-GM, GM               | A-1      | 10-25                           | 30-55                                | 20-50 | 15-35 | 5-20  | ---             | NP                       |
| 2090*:<br>Punchbowl----- | 0-3   | Cobbly loam-----                                                                   | SM, ML                  | A-4      | 25-40                           | 80-90                                | 75-85 | 60-75 | 40-55 | 15-25           | NP-5                     |
|                          | 3-7   | Loam, gravelly<br>loam.                                                            | SC, GC, CL              | A-6      | 0-5                             | 70-100                               | 65-95 | 60-85 | 45-55 | 25-35           | 10-15                    |
|                          | 7-11  | Gravelly clay<br>loam, gravelly<br>sandy clay loam.                                | GC                      | A-6, A-7 | 0-5                             | 55-65                                | 50-60 | 45-55 | 35-45 | 35-45           | 15-20                    |
|                          | 11    | Unweathered<br>bedrock.                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Robson-----              | 0-10  | Very cobbly loam                                                                   | GM-GC, GC,<br>SM-SC, SC | A-2      | 30-50                           | 55-75                                | 50-65 | 30-50 | 25-35 | 25-35           | 5-15                     |
|                          | 10-14 | Very cobbly clay<br>loam.                                                          | GC                      | A-7      | 30-45                           | 55-75                                | 50-60 | 40-60 | 35-50 | 40-45           | 15-20                    |
|                          | 14-19 | Very cobbly clay,<br>extremely cobbly<br>clay.                                     | GC, GM                  | A-7      | 50-80                           | 60-70                                | 50-65 | 40-55 | 35-50 | 45-55           | 20-25                    |
|                          | 19    | Unweathered<br>bedrock.                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Reluctan-----            | 0-8   | Very cobbly loam                                                                   | GM-GC                   | A-2, A-4 | 30-50                           | 55-65                                | 45-60 | 40-55 | 30-45 | 25-30           | 5-10                     |
|                          | 8-33  | Gravelly loam,<br>gravelly clay<br>loam.                                           | GC, CL                  | A-6, A-7 | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45           | 15-20                    |
|                          | 33-37 | Unweathered<br>bedrock.                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2091*:<br>Punchbowl----- | 0-3   | Very gravelly<br>loam.                                                             | GM                      | A-1, A-2 | 5-10                            | 45-60                                | 35-50 | 30-45 | 20-35 | 15-25           | NP-5                     |
|                          | 3-7   | Loam, gravelly<br>loam.                                                            | SC, CL, GC              | A-6      | 0-5                             | 70-100                               | 65-95 | 60-85 | 45-55 | 25-35           | 10-15                    |
|                          | 7-11  | Gravelly clay<br>loam, gravelly<br>sandy clay loam.                                | GC                      | A-6, A-7 | 0-5                             | 55-65                                | 50-60 | 45-55 | 35-45 | 35-45           | 15-20                    |
|                          | 11    | Unweathered<br>bedrock.                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Teguro-----              | 0-4   | Very gravelly<br>loam.                                                             | GM                      | A-1, A-2 | 0-5                             | 40-55                                | 35-50 | 30-45 | 20-35 | 15-25           | NP-5                     |
|                          | 4-16  | Gravelly clay<br>loam, gravelly<br>loam.                                           | SC                      | A-2, A-6 | 0-10                            | 65-80                                | 50-75 | 35-60 | 30-50 | 30-40           | 15-20                    |
|                          | 16-20 | Unweathered<br>bedrock.                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                        | Classification |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------|----------------|---------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                     | Unified        | AASHTO        |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                     |                |               | Pct                             |                                      |       |       |       | Pct             |                          |
| 2091*:<br>Sumine-----       | 0-10  | Very gravelly loam.                                                 | GM-GC          | A-2, A-4      | 10-15                           | 50-65                                | 45-60 | 40-50 | 30-40 | 20-30           | 5-10                     |
|                             | 10-30 | Very gravelly clay loam, very cobbly clay loam, very gravelly loam. | GC             | A-2, A-6, A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45           | 15-25                    |
|                             | 30-34 | Unweathered bedrock.                                                | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2092*:<br>Punchbowl-----    | 0-3   | Gravelly loam----                                                   | SM             | A-2, A-4      | 5-10                            | 65-85                                | 60-75 | 45-60 | 30-45 | 15-25           | NP-5                     |
|                             | 3-6   | Loam, gravelly loam.                                                | SC, GC, CL     | A-6           | 0-5                             | 70-100                               | 65-95 | 60-85 | 45-55 | 25-35           | 10-15                    |
|                             | 6-10  | Gravelly clay loam, gravelly sandy clay loam.                       | GC             | A-6, A-7      | 0-5                             | 55-65                                | 50-60 | 45-55 | 35-45 | 35-45           | 15-20                    |
|                             | 10-14 | Unweathered bedrock.                                                | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Belate-----                 | 0-14  | Very gravelly loam.                                                 | GM-GC          | A-2           | 5-15                            | 50-65                                | 35-50 | 30-40 | 25-35 | 20-25           | 5-10                     |
|                             | 14-60 | Very gravelly clay loam, very gravelly loam.                        | GC             | A-2, A-6      | 5-10                            | 50-65                                | 35-50 | 35-45 | 30-40 | 25-35           | 10-15                    |
| Reluctan-----               | 0-8   | Very gravelly loam.                                                 | GM-GC          | A-2, A-4      | 10-25                           | 35-65                                | 30-55 | 25-55 | 20-40 | 25-30           | 5-10                     |
|                             | 8-33  | Gravelly clay loam, gravelly loam.                                  | GC, CL         | A-6, A-7      | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45           | 15-20                    |
|                             | 33-37 | Unweathered bedrock.                                                | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2094*:<br>Punchbowl-----    | 0-3   | Very gravelly loam.                                                 | GM             | A-1, A-2      | 5-10                            | 45-60                                | 35-50 | 30-45 | 20-35 | 15-25           | NP-5                     |
|                             | 3-7   | Loam, gravelly loam.                                                | SC, CL, GC     | A-6           | 0-5                             | 70-100                               | 65-95 | 60-85 | 45-55 | 25-35           | 10-15                    |
|                             | 7-11  | Gravelly clay loam, gravelly sandy clay loam.                       | GC             | A-6, A-7      | 0-5                             | 55-65                                | 50-60 | 45-55 | 35-45 | 35-45           | 15-20                    |
|                             | 11    | Unweathered bedrock.                                                | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Jung-----                   | 0-8   | Very cobbly loam                                                    | GM-GC, SM-SC   | A-4           | 35-50                           | 65-80                                | 50-65 | 45-60 | 35-50 | 25-30           | 5-10                     |
|                             | 8-19  | Very cobbly clay loam, very cobbly clay, very gravelly clay loam.   | GC             | A-7           | 15-40                           | 55-65                                | 50-60 | 40-50 | 35-45 | 40-55           | 20-30                    |
|                             | 19    | Unweathered bedrock.                                                | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                        | Classification |               | Frag-ments<br>> 3 inches | Percentage passing<br>sieve number-- |       |       |       | Liquid limit | Plas-ticity index |
|--------------------------|-------|---------------------------------------------------------------------|----------------|---------------|--------------------------|--------------------------------------|-------|-------|-------|--------------|-------------------|
|                          |       |                                                                     | Unified        | AASHTO        |                          | 4                                    | 10    | 40    | 200   |              |                   |
|                          | In    |                                                                     |                |               | Pct                      |                                      |       |       |       | Pct          |                   |
| 2094*:<br>Locane-----    | 0-6   | Very gravelly loam.                                                 | GM-GC          | A-2           | 5-15                     | 50-65                                | 30-45 | 25-40 | 15-30 | 20-30        | 5-10              |
|                          | 6-14  | Very gravelly clay loam.                                            | GC             | A-2, A-7, A-6 | 0-10                     | 50-65                                | 35-50 | 30-45 | 25-40 | 35-45        | 15-20             |
|                          | 14    | Unweathered bedrock.                                                | ---            | ---           | ---                      | ---                                  | ---   | ---   | ---   | ---          | ---               |
| 2098*:<br>Punchbowl----- | 0-3   | Cobbly loam-----                                                    | SM, ML         | A-4           | 25-40                    | 80-90                                | 75-85 | 60-75 | 40-55 | 15-25        | NP-5              |
|                          | 3-7   | Loam, gravelly loam.                                                | SC, GC, CL     | A-6           | 0-5                      | 70-100                               | 65-95 | 60-85 | 45-55 | 25-35        | 10-15             |
|                          | 7-11  | Gravelly clay loam, gravelly sandy clay loam.                       | GC             | A-6, A-7      | 0-5                      | 55-65                                | 50-60 | 45-55 | 35-45 | 35-45        | 15-20             |
|                          | 11    | Unweathered bedrock.                                                | ---            | ---           | ---                      | ---                                  | ---   | ---   | ---   | ---          | ---               |
| Clan Alpine-----         | 0-12  | Very cobbly loam                                                    | GM-GC, SM-SC   | A-4           | 25-40                    | 65-75                                | 55-70 | 45-60 | 35-50 | 20-25        | 5-10              |
|                          | 12-38 | Very cobbly loam, very cobbly clay loam, very gravelly clay loam.   | GC             | A-2, A-6      | 15-35                    | 50-70                                | 35-60 | 25-50 | 20-40 | 30-40        | 10-20             |
|                          | 38-42 | Weathered bedrock                                                   | ---            | ---           | ---                      | ---                                  | ---   | ---   | ---   | ---          | ---               |
| Sumine-----              | 0-10  | Very gravelly loam.                                                 | GM-GC          | A-2, A-4      | 10-15                    | 50-65                                | 45-60 | 40-50 | 30-40 | 20-30        | 5-10              |
|                          | 10-30 | Very gravelly clay loam, very cobbly clay loam, very gravelly loam. | GC             | A-2, A-6, A-7 | 15-40                    | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45        | 15-25             |
|                          | 30-34 | Unweathered bedrock.                                                | ---            | ---           | ---                      | ---                                  | ---   | ---   | ---   | ---          | ---               |
| 2099*:<br>Punchbowl----- | 0-3   | Very gravelly loam.                                                 | GM             | A-1, A-2      | 5-10                     | 45-60                                | 35-50 | 30-45 | 20-35 | 15-25        | NP-5              |
|                          | 3-7   | Loam, gravelly loam.                                                | SC, CL, GC     | A-6           | 0-5                      | 70-100                               | 65-95 | 60-85 | 45-55 | 25-35        | 10-15             |
|                          | 7-11  | Gravelly clay loam, gravelly sandy clay loam.                       | GC             | A-6, A-7      | 0-5                      | 55-65                                | 50-60 | 45-55 | 35-45 | 35-45        | 15-20             |
|                          | 11    | Unweathered bedrock.                                                | ---            | ---           | ---                      | ---                                  | ---   | ---   | ---   | ---          | ---               |
| Roca-----                | 0-5   | Very cobbly loam                                                    | CL             | A-6           | 50-60                    | 85-100                               | 75-85 | 70-80 | 50-60 | 25-35        | 10-15             |
|                          | 5-27  | Very gravelly clay loam, very gravelly clay.                        | GC, SC         | A-2           | 0-10                     | 60-75                                | 30-50 | 25-45 | 20-35 | 45-60        | 20-30             |
|                          | 27-31 | Unweathered bedrock.                                                | ---            | ---           | ---                      | ---                                  | ---   | ---   | ---   | ---          | ---               |
| Rock outcrop.            |       |                                                                     |                |               |                          |                                      |       |       |       |              |                   |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                  | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                               | Unified                 | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                        |                          |
|                             | In    |                                                                               |                         |          | Pct                             |                                      |        |       |       |                        |                          |
| 2100*:<br>Grassval-----     | 0-4   | Gravelly loam----                                                             | SM-SC                   | A-2, A-4 | 0-5                             | 65-80                                | 55-70  | 45-60 | 30-45 | 20-25                  | 5-10                     |
|                             | 4-13  | Gravelly clay<br>loam, gravelly<br>loam.                                      | GC                      | A-6      | 0-10                            | 65-75                                | 55-70  | 50-65 | 35-50 | 30-40                  | 15-20                    |
|                             | 13    | Indurated-----                                                                | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Grina-----                  | 0-3   | Very gravelly<br>loam.                                                        | GM-GC, GC               | A-2      | 0-5                             | 45-60                                | 30-45  | 25-40 | 15-30 | 25-35                  | 5-15                     |
|                             | 3-14  | Loam, silt loam,<br>silty clay loam.                                          | CL                      | A-6, A-7 | 0                               | 90-100                               | 80-100 | 75-95 | 60-85 | 30-45                  | 10-20                    |
|                             | 14-18 | Weathered bedrock                                                             | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Unsel Variant---            | 0-2   | Very gravelly<br>loam.                                                        | GM-GC                   | A-2      | 10-15                           | 45-60                                | 35-50  | 30-45 | 20-35 | 20-30                  | 5-10                     |
|                             | 2-15  | Gravelly clay<br>loam.                                                        | SC                      | A-6, A-7 | 0                               | 70-80                                | 55-70  | 45-60 | 35-50 | 35-45                  | 15-20                    |
|                             | 15-22 | Gravelly loam----                                                             | SM-SC, SC               | A-4, A-6 | 0                               | 70-85                                | 55-70  | 45-60 | 35-50 | 25-35                  | 5-15                     |
|                             | 22    | Weathered bedrock                                                             | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| 2104*:<br>Grassval-----     | 0-4   | Very gravelly<br>sandy loam.                                                  | GM-GC                   | A-2      | 5-10                            | 45-60                                | 35-50  | 25-45 | 15-30 | 20-25                  | 5-10                     |
|                             | 4-13  | Gravelly clay<br>loam, gravelly<br>loam.                                      | GC                      | A-6      | 0-10                            | 65-75                                | 55-70  | 50-65 | 35-50 | 30-40                  | 15-20                    |
|                             | 13    | Indurated-----                                                                | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Zineb-----                  | 0-6   | Gravelly very<br>fine sandy loam.                                             | SM-SC,<br>CL-ML         | A-4      | 0-10                            | 70-90                                | 55-75  | 50-70 | 35-55 | 20-30                  | 5-10                     |
|                             | 6-13  | Gravelly loam,<br>gravelly very<br>fine sandy loam.                           | SM-SC,<br>CL-ML         | A-4      | 0-10                            | 70-90                                | 55-75  | 50-70 | 35-55 | 20-30                  | 5-10                     |
|                             | 13-19 | Very gravelly<br>sandy loam, very<br>gravelly loam.                           | GM                      | A-1      | 0-10                            | 30-60                                | 25-55  | 20-45 | 10-25 | 15-25                  | NP-5                     |
|                             | 19-27 | Extremely cobbly<br>sandy loam.                                               | GP-GM, GM               | A-1      | 50-75                           | 20-50                                | 15-45  | 10-30 | 5-20  | 15-25                  | NP-5                     |
|                             | 27-60 | Extremely cobbly<br>coarse sand,<br>extremely cobbly<br>loamy coarse<br>sand. | GP, GP-GM               | A-1      | 50-75                           | 20-50                                | 15-45  | 5-25  | 0-10  | ---                    | NP                       |
| Izod-----                   | 0-4   | Cobbly loam-----                                                              | SM-SC, SM,<br>CL-ML, ML | A-4      | 15-30                           | 80-95                                | 70-90  | 55-75 | 45-65 | 25-35                  | 5-10                     |
|                             | 4-10  | Very gravelly<br>loam, extremely<br>gravelly loam.                            | GM-GC, GM               | A-2      | 0-25                            | 20-55                                | 15-50  | 15-45 | 10-35 | 25-35                  | 5-10                     |
|                             | 10    | Unweathered<br>bedrock.                                                       | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| 2521-----<br>Stingdorn      | 0-7   | Very cobbly loam                                                              | SM-SC                   | A-2, A-4 | 30-50                           | 70-85                                | 55-70  | 40-55 | 30-40 | 20-30                  | 5-10                     |
|                             | 7-15  | Very cobbly clay<br>loam.                                                     | GC                      | A-6      | 30-50                           | 60-75                                | 50-65  | 45-60 | 35-50 | 35-40                  | 15-20                    |
|                             | 15-20 | Indurated-----                                                                | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
|                             | 20    | Unweathered<br>bedrock.                                                       | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                     | Classification  |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |        |        | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|------------------------------------------------------------------|-----------------|------------------|---------------------------------|--------------------------------------|-------|--------|--------|-----------------|--------------------------|
|                          |       |                                                                  | Unified         | AASHTO           |                                 | 4                                    | 10    | 40     | 200    |                 |                          |
|                          | In    |                                                                  |                 |                  | Pct                             |                                      |       |        |        | Pct             |                          |
| 2522*:<br>Stingdorn----- | 0-7   | Cobbly loam-----                                                 | SM-SC           | A-4              | 25-40                           | 85-95                                | 75-90 | 55-80  | 40-50  | 20-30           | 5-10                     |
|                          | 7-15  | Very cobbly clay<br>loam.                                        | GC              | A-6              | 30-50                           | 60-75                                | 50-65 | 45-60  | 35-50  | 35-40           | 15-20                    |
|                          | 15-20 | Indurated-----                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---             | ---                      |
|                          | 20    | Unweathered<br>bedrock.                                          | ---             | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---             | ---                      |
| Stingdorn, steep         | 0-7   | Extremely cobbly<br>loam.                                        | GM, GM-GC       | A-1, A-2         | 50-60                           | 45-60                                | 35-50 | 30-45  | 15-30  | 15-25           | NP-10                    |
|                          | 7-15  | Very cobbly clay<br>loam.                                        | GC              | A-6              | 30-50                           | 60-75                                | 50-65 | 45-60  | 35-50  | 35-40           | 15-20                    |
|                          | 15-20 | Indurated-----                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---             | ---                      |
|                          | 20    | Unweathered<br>bedrock.                                          | ---             | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---             | ---                      |
| Colbar-----              | 0-3   | Very cobbly loam                                                 | CL-ML           | A-4              | 50-60                           | 90-100                               | 85-95 | 75-85  | 50-60  | 20-30           | 5-10                     |
|                          | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.      | CL              | A-6              | 10-35                           | 90-95                                | 70-85 | 60-80  | 50-65  | 30-40           | 10-20                    |
|                          | 22-26 | Gravelly loam,<br>cobbly loam.                                   | SM-SC,<br>CL-ML | A-4              | 5-30                            | 75-95                                | 60-90 | 55-75  | 35-55  | 20-30           | 5-10                     |
|                          | 26-30 | Unweathered<br>bedrock.                                          | ---             | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---             | ---                      |
| 2530*:<br>Perwick-----   | 0-3   | Very gravelly<br>loam.                                           | SM-SC           | A-2              | 0                               | 70-80                                | 40-50 | 35-45  | 25-35  | 20-30           | 5-10                     |
|                          | 3-16  | Gravelly loam,<br>gravelly silt<br>loam, gravelly<br>sandy loam. | GM-GC,<br>SM-SC | A-4              | 0                               | 70-80                                | 50-75 | 40-60  | 35-50  | 20-30           | 5-10                     |
|                          | 16-26 | Fine sandy loam,<br>sandy loam,<br>loam.                         | SM, ML          | A-2, A-4         | 0                               | 95-100                               | 80-90 | 60-75  | 30-60  | 20-25           | NP-5                     |
|                          | 26    | Weathered bedrock                                                | ---             | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---             | ---                      |
| Puett-----               | 0-3   | Gravelly loam----                                                | GM-GC,<br>SM-SC | A-4              | 0-5                             | 65-85                                | 55-75 | 50-70  | 35-50  | 20-30           | 5-10                     |
|                          | 3-10  | Coarse sandy<br>loam, gravelly<br>loam, sandy<br>loam.           | SM, ML, GM      | A-1, A-2,<br>A-4 | 0                               | 55-95                                | 50-90 | 30-80  | 15-55  | ---             | NP                       |
|                          | 10-14 | Weathered bedrock                                                | ---             | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---             | ---                      |
| Tulase-----              | 0-6   | Silt loam-----                                                   | CL-ML, ML       | A-4              | 0                               | 100                                  | 100   | 100    | 90-100 | 15-25           | NP-10                    |
|                          | 6-60  | Very fine sandy<br>loam, silt loam.                              | CL-ML, ML       | A-4              | 0                               | 100                                  | 100   | 95-100 | 70-85  | 15-25           | NP-10                    |
| 2540*:<br>Buffaran-----  | 0-4   | Cobbly loam-----                                                 | SC, CL          | A-6              | 15-30                           | 75-90                                | 75-85 | 50-75  | 40-60  | 25-35           | 10-15                    |
|                          | 4-15  | Gravelly clay<br>loam, gravelly<br>clay, clay.                   | CL, CH          | A-7              | 0-5                             | 75-90                                | 70-85 | 65-80  | 50-65  | 40-55           | 20-30                    |
|                          | 15-60 | Indurated-----                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---    | ---    | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                              | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                          |       |                                                                                           | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                          | In    |                                                                                           |                         |          | Pct                             |                                      |       |       |       |                        |                          |
| 2540*:<br>Wieland-----   | 0-8   | Gravelly loam----                                                                         | GC, CL, SC              | A-6      | 0-5                             | 60-85                                | 50-75 | 45-70 | 35-60 | 25-35                  | 10-15                    |
|                          | 8-20  | Gravelly clay,<br>clay.                                                                   | CH, SC                  | A-7      | 0-5                             | 75-95                                | 55-90 | 50-80 | 45-75 | 50-60                  | 25-35                    |
|                          | 20-60 | Loam, gravelly<br>loam, gravelly<br>sandy loam.                                           | CL-ML,<br>SM-SC         | A-4, A-2 | 0-5                             | 65-95                                | 55-90 | 40-85 | 25-70 | 20-30                  | 5-10                     |
| 2541*:<br>Buffaran-----  | 0-4   | Gravelly loam----                                                                         | SC, CL                  | A-6      | 5-15                            | 75-90                                | 70-80 | 50-75 | 40-60 | 25-35                  | 10-15                    |
|                          | 4-15  | Gravelly clay<br>loam, gravelly<br>clay, clay.                                            | CL, CH                  | A-7      | 0-5                             | 75-90                                | 70-85 | 65-80 | 50-65 | 40-55                  | 20-30                    |
|                          | 15-60 | Indurated-----                                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Zoesta-----              | 0-7   | Cobbly loam-----                                                                          | CL-ML, ML               | A-4      | 25-40                           | 80-90                                | 75-90 | 65-80 | 50-65 | 20-30                  | NP-10                    |
|                          | 7-23  | Clay-----                                                                                 | CL, CH                  | A-7      | 0-10                            | 90-100                               | 85-95 | 75-90 | 65-80 | 45-60                  | 20-30                    |
|                          | 23-31 | Gravelly clay<br>loam, gravelly<br>clay.                                                  | GC, CL                  | A-6, A-7 | 0                               | 60-75                                | 55-70 | 50-65 | 40-55 | 35-50                  | 15-25                    |
|                          | 31-60 | Very gravelly<br>clay loam, very<br>gravelly loam.                                        | GC                      | A-2      | 0                               | 45-55                                | 30-45 | 25-40 | 20-35 | 30-40                  | 10-15                    |
| 2550*:<br>Laped-----     | 0-3   | Gravelly loam----                                                                         | GM-GC,<br>SM-SC         | A-4      | 0-5                             | 65-80                                | 55-70 | 50-65 | 35-50 | 20-30                  | 5-10                     |
|                          | 3-22  | Gravelly clay<br>loam.                                                                    | GC, SC                  | A-6, A-7 | 0-10                            | 60-80                                | 55-75 | 45-60 | 35-50 | 35-45                  | 15-20                    |
|                          | 22-26 | Indurated-----                                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                          | 26-30 | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Old Camp-----            | 0-2   | Gravelly loam----                                                                         | SM-SC                   | A-4      | 0-5                             | 70-85                                | 60-75 | 50-65 | 35-50 | 25-30                  | 5-10                     |
|                          | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC                      | A-2, A-6 | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40                  | 15-25                    |
|                          | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Colbar-----              | 0-6   | Gravelly loam----                                                                         | SM-SC, SM,<br>GM, GM-GC | A-4      | 0-5                             | 65-85                                | 60-75 | 50-65 | 35-50 | 20-30                  | NP-10                    |
|                          | 6-16  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                               | CL                      | A-6      | 10-35                           | 75-90                                | 70-85 | 60-80 | 50-65 | 30-40                  | 10-20                    |
|                          | 16-21 | Gravelly loam,<br>cobbly loam.                                                            | SM-SC,<br>CL-ML         | A-4      | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30                  | 5-10                     |
|                          | 21    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 2551*:<br>Laped-----     | 0-6   | Gravelly loam----                                                                         | GM-GC,<br>SM-SC         | A-4      | 0-5                             | 65-80                                | 55-70 | 50-65 | 35-50 | 20-30                  | 5-10                     |
|                          | 6-18  | Gravelly clay<br>loam.                                                                    | GC, SC                  | A-6, A-7 | 0-10                            | 60-80                                | 55-75 | 45-60 | 35-50 | 35-45                  | 15-20                    |
|                          | 18-23 | Indurated-----                                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                          | 23    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                              | Classification  |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------|-----------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                           | Unified         | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                           |                 |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 2551*:<br>Colbar-----       | 0-3   | Cobbly loam-----                                                                          | CL-ML           | A-4              | 35-45                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30           | 5-10                     |
|                             | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                               | CL              | A-6              | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                             | 22-26 | Gravelly loam,<br>cobbly loam.                                                            | SM-SC,<br>CL-ML | A-4              | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                             | 26-30 | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Osoll-----                  | 0-5   | Gravelly loam-----                                                                        | GM-GC,<br>CL-ML | A-4              | 0                               | 60-80                                | 55-75 | 45-65 | 35-60 | 20-25           | 5-10                     |
|                             | 5-12  | Very gravelly<br>loam, very<br>gravelly fine<br>sandy loam.                               | GM-GC           | A-2              | 10-25                           | 30-55                                | 25-50 | 20-50 | 10-35 | 20-25           | 5-10                     |
|                             | 12-35 | Indurated-----                                                                            | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 35    | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2552*:<br>Laped-----        | 0-6   | Gravelly very<br>fine sandy loam.                                                         | SM-SC           | A-2, A-4         | 0-5                             | 65-80                                | 55-70 | 45-60 | 30-45 | 20-30           | 5-10                     |
|                             | 6-18  | Gravelly clay<br>loam.                                                                    | GC, SC          | A-6, A-7         | 0-10                            | 60-80                                | 55-75 | 45-60 | 35-50 | 35-45           | 15-20                    |
|                             | 18-23 | Indurated-----                                                                            | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 23    | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Old Camp-----               | 0-2   | Very gravelly<br>fine sandy loam.                                                         | GM, GM-GC       | A-1, A-2         | 5-10                            | 45-60                                | 35-50 | 25-40 | 10-25 | 15-25           | NP-10                    |
|                             | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC              | A-2, A-6         | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40           | 15-25                    |
|                             | 14    | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Puett-----                  | 0-4   | Fine sandy loam                                                                           | SM              | A-4              | 0                               | 90-100                               | 85-95 | 60-80 | 35-50 | ---             | NP                       |
|                             | 4-15  | Coarse sandy<br>loam, fine sandy<br>loam, sandy<br>loam.                                  | SM, ML          | A-1, A-2,<br>A-4 | 0                               | 80-100                               | 75-95 | 40-80 | 15-55 | ---             | NP                       |
|                             | 15-19 | Weathered bedrock                                                                         | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2553*:<br>Laped-----        | 0-6   | Cobbly loam-----                                                                          | CL-ML           | A-4              | 15-25                           | 80-95                                | 75-90 | 65-80 | 50-65 | 20-30           | 5-10                     |
|                             | 6-18  | Gravelly clay<br>loam.                                                                    | GC, SC          | A-6, A-7         | 0-5                             | 60-80                                | 55-70 | 45-60 | 35-50 | 35-45           | 15-20                    |
|                             | 18-23 | Indurated-----                                                                            | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 23    | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Stingdorn-----              | 0-7   | Cobbly loam-----                                                                          | SM-SC           | A-4              | 25-40                           | 85-95                                | 75-90 | 55-80 | 40-50 | 20-30           | 5-10                     |
|                             | 7-15  | Very cobbly clay<br>loam.                                                                 | GC              | A-6              | 30-50                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-40           | 15-20                    |
|                             | 15-20 | Indurated-----                                                                            | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 20    | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                | Classification  |                  | Frag-ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------------------|-----------------|------------------|-----------------------------|--------------------------------------|--------|-------|-------|------------------------|--------------------------|
|                          |       |                                                             | Unified         | AASHTO           |                             | 4                                    | 10     | 40    | 200   |                        |                          |
|                          | In    |                                                             |                 |                  | Pct                         |                                      |        |       |       |                        |                          |
| 2553*:<br>Colbar-----    | 0-3   | Very cobbly loam                                            | CL-ML           | A-4              | 50-60                       | 90-100                               | 85-95  | 75-85 | 50-60 | 20-30                  | 5-10                     |
|                          | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam. | CL              | A-6              | 10-35                       | 90-95                                | 70-85  | 60-80 | 50-65 | 30-40                  | 10-20                    |
|                          | 22-26 | Gravelly loam,<br>cobbly loam.                              | SM-SC,<br>CL-ML | A-4              | 5-30                        | 75-95                                | 60-90  | 55-75 | 35-55 | 20-30                  | 5-10                     |
|                          | 26-30 | Unweathered<br>bedrock.                                     | ---             | ---              | ---                         | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| 2555*:<br>Laped-----     | 0-6   | Very cobbly loam                                            | SM-SC,<br>GM-GC | A-4              | 30-50                       | 65-80                                | 50-70  | 45-60 | 35-50 | 20-30                  | 5-10                     |
|                          | 6-18  | Gravelly clay<br>loam.                                      | GC, SC          | A-6, A-7         | 0-5                         | 60-80                                | 55-70  | 45-60 | 35-50 | 35-45                  | 15-20                    |
|                          | 18-23 | Indurated-----                                              | ---             | ---              | ---                         | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
|                          | 23    | Unweathered<br>bedrock.                                     | ---             | ---              | ---                         | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Colbar-----              | 0-3   | Very cobbly loam                                            | CL-ML           | A-4              | 50-60                       | 90-100                               | 85-95  | 75-85 | 50-60 | 20-30                  | 5-10                     |
|                          | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam. | CL              | A-6              | 10-35                       | 90-95                                | 70-85  | 60-80 | 50-65 | 30-40                  | 10-20                    |
|                          | 22-26 | Gravelly loam,<br>cobbly loam.                              | SM-SC,<br>CL-ML | A-4              | 5-30                        | 75-95                                | 60-90  | 55-75 | 35-55 | 20-30                  | 5-10                     |
|                          | 26-30 | Unweathered<br>bedrock.                                     | ---             | ---              | ---                         | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| 2561*:<br>Puett-----     | 0-4   | Very gravelly<br>loam.                                      | GM              | A-1, A-2         | 0-10                        | 50-60                                | 40-50  | 35-45 | 20-35 | 15-20                  | NP-5                     |
|                          | 4-15  | Coarse sandy<br>loam, gravelly<br>loam, sandy<br>loam.      | SM, ML, GM      | A-1, A-2,<br>A-4 | 0                           | 55-95                                | 50-90  | 30-80 | 15-55 | ---                    | NP                       |
|                          | 15-19 | Weathered bedrock                                           | ---             | ---              | ---                         | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Genaw-----               | 0-6   | Gravelly loam----                                           | GM-GC,<br>SM-SC | A-4              | 0-5                         | 65-80                                | 55-75  | 45-65 | 35-50 | 20-30                  | 5-10                     |
|                          | 6-11  | Gravelly loam,<br>gravelly clay<br>loam.                    | GC, SC          | A-6              | 0-5                         | 60-80                                | 55-75  | 45-65 | 35-50 | 25-35                  | 10-15                    |
|                          | 11-16 | Very gravelly<br>loam.                                      | GM-GC           | A-2              | 0-5                         | 45-55                                | 35-50  | 25-45 | 20-35 | 25-30                  | 5-10                     |
|                          | 16    | Weathered bedrock                                           | ---             | ---              | ---                         | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Orovada-----             | 0-8   | Fine sandy loam                                             | SM              | A-2, A-4         | 0                           | 95-100                               | 90-100 | 75-95 | 30-50 | ---                    | NP                       |
|                          | 8-20  | Fine sandy loam,<br>loam.                                   | SM, ML          | A-4              | 0                           | 75-100                               | 75-95  | 60-80 | 40-60 | 20-30                  | NP-5                     |
|                          | 20-60 | Stratified fine<br>sandy loam to<br>silt loam.              | SM, ML          | A-4              | 0                           | 75-100                               | 75-95  | 60-85 | 35-55 | 20-30                  | NP-5                     |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol   | Depth | USDA texture                                                                 | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|----------------------------|-------|------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                            |       |                                                                              | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                            | In    |                                                                              |                         |          | Pct                             |                                      |       |       |       | Pct             |                          |
| 2571*:<br>Colbar, steep--- | 0-3   | Very cobbly loam                                                             | CL-ML                   | A-4      | 50-60                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30           | 5-10                     |
|                            | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                  | CL                      | A-6      | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                            | 22-26 | Gravelly loam,<br>cobbly loam.                                               | SM-SC,<br>CL-ML         | A-4      | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                            | 26-30 | Unweathered<br>bedrock.                                                      | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Burrita-----               | 0-3   | Very cobbly loam                                                             | GM-GC                   | A-4      | 25-40                           | 60-70                                | 55-65 | 50-60 | 35-45 | 15-25           | 5-10                     |
|                            | 3-18  | Very cobbly clay,<br>very stony clay<br>loam, very<br>gravelly clay<br>loam. | GC, SC                  | A-2, A-7 | 10-55                           | 35-75                                | 30-55 | 25-50 | 20-45 | 40-55           | 20-30                    |
|                            | 18-22 | Unweathered<br>bedrock.                                                      | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Colbar-----                | 0-3   | Gravelly loam----                                                            | SM-SC, SM,<br>GM, GM-GC | A-4      | 0-5                             | 65-85                                | 60-75 | 50-65 | 35-50 | 20-30           | NP-10                    |
|                            | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                  | CL                      | A-6      | 10-35                           | 75-90                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                            | 22-26 | Gravelly loam,<br>cobbly loam.                                               | SM-SC,<br>CL-ML         | A-4      | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                            | 26-30 | Unweathered<br>bedrock.                                                      | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2573*:<br>Colbar-----      | 0-3   | Cobbly loam-----                                                             | CL-ML                   | A-4      | 35-45                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30           | 5-10                     |
|                            | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                  | CL                      | A-6      | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                            | 22-26 | Gravelly loam,<br>cobbly loam.                                               | SM-SC,<br>CL-ML         | A-4      | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                            | 26-30 | Unweathered<br>bedrock.                                                      | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Midraw-----                | 0-6   | Very cobbly loam                                                             | CL, GC                  | A-6, A-2 | 30-40                           | 50-75                                | 40-70 | 35-60 | 30-55 | 25-35           | 10-15                    |
|                            | 6-16  | Gravelly clay,<br>gravelly clay<br>loam.                                     | GC, CL                  | A-7      | 0-10                            | 65-75                                | 55-70 | 50-65 | 45-60 | 40-50           | 15-25                    |
|                            | 16-31 | Indurated-----                                                               | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                            | 31    | Unweathered<br>bedrock.                                                      | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2575*:<br>Colbar-----      | 0-3   | Gravelly loam----                                                            | SM-SC, SM,<br>GM, GM-GC | A-4      | 0-5                             | 65-85                                | 60-75 | 50-65 | 35-50 | 20-30           | NP-10                    |
|                            | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                  | CL                      | A-6      | 10-35                           | 75-90                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                            | 22-26 | Gravelly loam,<br>cobbly loam.                                               | SM-SC,<br>CL-ML         | A-4      | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                            | 26-30 | Unweathered<br>bedrock.                                                      | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol    | Depth | USDA texture                                            | Classification |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------|----------------|---------------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                             |       |                                                         | Unified        | AASHTO        |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                             | In    |                                                         |                |               | Pct                             |                                      |        |        |       |                        |                          |
| 2575*:<br>Perwick-----      | 0-6   | Very gravelly loam.                                     | SM-SC          | A-2           | 0                               | 70-80                                | 40-50  | 35-45  | 25-35 | 20-30                  | 5-10                     |
|                             | 6-27  | Gravelly loam, gravelly silt loam, gravelly sandy loam. | GM-GC, SM-SC   | A-4           | 0                               | 70-80                                | 50-75  | 40-60  | 35-50 | 20-30                  | 5-10                     |
|                             | 27-31 | Weathered bedrock                                       | ---            | ---           | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Settlemeier----             | 0-16  | Loam-----                                               | CL, CL-ML      | A-4, A-6      | 0                               | 100                                  | 100    | 80-95  | 60-75 | 25-35                  | 5-15                     |
|                             | 16-40 | Silt loam, silty clay loam.                             | CL             | A-6, A-7      | 0                               | 95-100                               | 90-100 | 85-90  | 60-85 | 35-45                  | 15-20                    |
|                             | 40-60 | Fine sandy loam                                         | CL-ML, SM-SC   | A-4           | 0                               | 95-100                               | 90-100 | 80-90  | 40-60 | 20-30                  | 5-10                     |
| 2591*:<br>Oscoll Variant--- | 0-10  | Gravelly loam----                                       | SM-SC          | A-2, A-4      | 0-5                             | 70-80                                | 60-75  | 50-70  | 30-45 | 25-30                  | 5-10                     |
|                             | 10-26 | Very gravelly loam.                                     | GM-GC          | A-2           | 5-10                            | 45-60                                | 35-50  | 30-45  | 20-35 | 25-30                  | 5-10                     |
|                             | 26-60 | Indurated-----                                          | ---            | ---           | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Oxcorel-----                | 0-5   | Gravelly loam----                                       | SM-SC, GM-GC   | A-4           | 0-10                            | 60-85                                | 55-75  | 45-60  | 35-50 | 25-30                  | 5-10                     |
|                             | 5-36  | Clay, clay loam                                         | CL, CH         | A-7           | 0-5                             | 85-95                                | 80-90  | 75-85  | 65-80 | 40-55                  | 20-30                    |
|                             | 36-60 | Very gravelly sandy loam, very gravelly loam.           | GM             | A-1           | 0-15                            | 30-60                                | 25-50  | 20-40  | 15-25 | 15-25                  | NP-5                     |
| 2600*:<br>Grina-----        | 0-5   | Gravelly loam----                                       | SM-SC, SC      | A-4, A-6      | 0-5                             | 70-85                                | 55-70  | 45-60  | 35-50 | 25-35                  | 5-15                     |
|                             | 5-14  | Loam, silt loam, silty clay loam.                       | CL             | A-6, A-7      | 0                               | 90-100                               | 80-100 | 75-95  | 60-85 | 30-45                  | 10-20                    |
|                             | 14    | Weathered bedrock                                       | ---            | ---           | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Caniwe-----                 | 0-17  | Silt loam-----                                          | ML             | A-4           | 0                               | 100                                  | 100    | 95-100 | 85-95 | 25-35                  | NP-5                     |
|                             | 17-60 | Stratified silt loam to silty clay loam.                | ML             | A-4, A-7, A-6 | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-50                  | 5-15                     |
| Handy-----                  | 0-4   | Loam-----                                               | CL-ML, CL, ML  | A-4, A-6      | 0-5                             | 90-100                               | 85-100 | 70-85  | 60-75 | 20-35                  | NP-15                    |
|                             | 4-30  | Gravelly clay, clay.                                    | CH, CL         | A-7           | 0-5                             | 70-100                               | 60-100 | 60-75  | 50-70 | 45-55                  | 30-35                    |
|                             | 30-60 | Stratified gravelly loam to very gravelly loamy sand.   | GM             | A-1, A-2      | 0-5                             | 35-65                                | 30-60  | 20-55  | 10-35 | 15-25                  | NP-5                     |
| 2602*:<br>Grina-----        | 0-5   | Gravelly loam----                                       | SM-SC, SC      | A-4, A-6      | 0-5                             | 70-85                                | 55-70  | 45-60  | 35-50 | 25-35                  | 5-15                     |
|                             | 5-15  | Loam, silt loam, silty clay loam.                       | CL             | A-6, A-7      | 0                               | 90-100                               | 80-100 | 75-95  | 60-85 | 30-45                  | 10-20                    |
|                             | 15-19 | Weathered bedrock                                       | ---            | ---           | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Grina, eroded---            | 0-3   | Very gravelly loam.                                     | GM-GC, GC      | A-2           | 0-5                             | 45-60                                | 30-45  | 25-40  | 15-30 | 25-35                  | 5-15                     |
|                             | 3-14  | Loam, silt loam, silty clay loam.                       | CL             | A-6, A-7      | 0                               | 90-100                               | 80-100 | 75-95  | 60-85 | 30-45                  | 10-20                    |
|                             | 14-18 | Weathered bedrock                                       | ---            | ---           | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol   | Depth | USDA texture                                                   | Classification   |                  | Frag-ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|----------------------------|-------|----------------------------------------------------------------|------------------|------------------|-----------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                            |       |                                                                | Unified          | AASHTO           |                             | 4                                    | 10     | 40     | 200   |                 |                          |
|                            | In    |                                                                |                  |                  | Pct                         |                                      |        |        |       | Pct             |                          |
| 2602*:<br>Caniwe-----      | 0-17  | Silt loam-----                                                 | ML               | A-4              | 0                           | 100                                  | 100    | 95-100 | 85-95 | 25-35           | NP-5                     |
|                            | 17-60 | Stratified silt<br>loam to silty<br>clay loam.                 | ML               | A-4, A-7,<br>A-6 | 0                           | 100                                  | 100    | 95-100 | 85-95 | 30-50           | 5-15                     |
| 2620*:<br>Handy-----       | 0-9   | Loam-----                                                      | CL-ML, CL,<br>ML | A-4, A-6         | 0-5                         | 90-100                               | 85-100 | 70-85  | 60-75 | 20-35           | NP-15                    |
|                            | 9-38  | Gravelly clay,<br>clay.                                        | CH, CL           | A-7              | 0-5                         | 70-100                               | 60-100 | 60-75  | 50-70 | 45-55           | 30-35                    |
|                            | 38-60 | Stratified<br>gravelly loam to<br>very gravelly<br>loamy sand. | GM               | A-1, A-2         | 0-5                         | 35-65                                | 30-60  | 20-55  | 10-35 | 15-25           | NP-5                     |
| Caniwe-----                | 0-17  | Silt loam-----                                                 | ML               | A-4              | 0                           | 100                                  | 100    | 95-100 | 85-95 | 25-35           | NP-5                     |
|                            | 17-60 | Stratified silt<br>loam to silty<br>clay loam.                 | ML               | A-4, A-7,<br>A-6 | 0                           | 100                                  | 100    | 95-100 | 85-95 | 30-50           | 5-15                     |
| Zoesta-----                | 0-7   | Loam-----                                                      | CL-ML, ML        | A-4              | 0-5                         | 85-95                                | 80-90  | 65-80  | 50-65 | 20-30           | NP-10                    |
|                            | 7-23  | Clay-----                                                      | CL, CH           | A-7              | 0-10                        | 90-100                               | 85-95  | 75-90  | 65-80 | 45-60           | 20-30                    |
|                            | 23-31 | Gravelly clay<br>loam, gravelly<br>clay.                       | GC, CL           | A-6, A-7         | 0                           | 60-75                                | 55-70  | 50-65  | 40-55 | 35-50           | 15-25                    |
|                            | 31-60 | Very gravelly<br>clay loam, very<br>gravelly loam.             | GC               | A-2              | 0                           | 45-55                                | 30-45  | 25-40  | 20-35 | 30-40           | 10-15                    |
| 2621*:<br>Handy, gravelly- | 0-4   | Gravelly loam----                                              | SC               | A-2, A-6         | 0-10                        | 65-75                                | 55-65  | 40-50  | 30-40 | 30-35           | 10-15                    |
|                            | 4-30  | Gravelly clay,<br>clay.                                        | CH, CL           | A-7              | 0-10                        | 70-100                               | 60-100 | 60-75  | 50-70 | 45-55           | 30-35                    |
|                            | 30-60 | Stratified<br>gravelly loam to<br>very gravelly<br>loamy sand. | GM               | A-1, A-2         | 0-10                        | 35-65                                | 30-60  | 20-55  | 10-35 | 15-25           | NP-5                     |
| Handy-----                 | 0-4   | Loam-----                                                      | CL-ML, CL,<br>ML | A-4, A-6         | 0-5                         | 90-100                               | 85-100 | 70-85  | 60-75 | 20-35           | NP-15                    |
|                            | 4-30  | Gravelly clay,<br>clay.                                        | CH, CL           | A-7              | 0-5                         | 70-100                               | 60-100 | 60-75  | 50-70 | 45-55           | 30-35                    |
|                            | 30-60 | Stratified<br>gravelly loam to<br>very gravelly<br>loamy sand. | GM               | A-1, A-2         | 0-5                         | 35-65                                | 30-60  | 20-55  | 10-35 | 15-25           | NP-5                     |
| Zoesta-----                | 0-7   | Cobbly loam-----                                               | CL-ML, ML        | A-4              | 25-40                       | 80-90                                | 75-90  | 65-80  | 50-65 | 20-30           | NP-10                    |
|                            | 7-23  | Clay-----                                                      | CL, CH           | A-7              | 0-10                        | 90-100                               | 85-95  | 75-90  | 65-80 | 45-60           | 20-30                    |
|                            | 23-31 | Gravelly clay<br>loam, gravelly<br>clay.                       | GC, CL           | A-6, A-7         | 0                           | 60-75                                | 55-70  | 50-65  | 40-55 | 35-50           | 15-25                    |
|                            | 31-60 | Very gravelly<br>clay loam, very<br>gravelly loam.             | GC               | A-2              | 0                           | 45-55                                | 30-45  | 25-40  | 20-35 | 30-40           | 10-15                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                            | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |        | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|-----------------------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|--------|--------|------------------------|--------------------------|
|                             |       |                                                                                         | Unified        | AASHTO   |                                 | 4                                    | 10     | 40     | 200    |                        |                          |
|                             | In    |                                                                                         |                |          | Pct                             |                                      |        |        |        | Pct                    |                          |
| 2631*:<br>Midraw-----       | 0-2   | Very gravelly<br>loam.                                                                  | GC             | A-2      | 0-10                            | 35-55                                | 25-50  | 20-40  | 15-35  | 25-35                  | 10-15                    |
|                             | 2-19  | Gravelly clay<br>loam, gravelly<br>clay.                                                | GC, CL         | A-7      | 0-10                            | 60-80                                | 55-75  | 50-70  | 40-60  | 40-50                  | 20-25                    |
|                             | 19-25 | Indurated-----                                                                          | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
|                             | 25    | Unweathered<br>bedrock.                                                                 | ---            | ---      | ---                             | ---                                  | ---    | ---    | ---    | ---                    | ---                      |
| Minat-----                  | 0-9   | Gravelly loam----                                                                       | GM-GC, GC      | A-4, A-6 | 5-10                            | 65-75                                | 55-70  | 50-65  | 35-50  | 25-35                  | 5-15                     |
|                             | 9-27  | Very gravelly<br>loam.                                                                  | GC, GM-GC      | A-2      | 0-10                            | 45-60                                | 30-50  | 25-45  | 20-35  | 25-35                  | 5-15                     |
|                             | 27-60 | Very gravelly<br>loam, very<br>gravelly fine<br>sandy loam.                             | GM-GC, GC      | A-2      | 0-10                            | 45-60                                | 30-50  | 20-45  | 15-30  | 25-35                  | 5-15                     |
| Pineval-----                | 0-5   | Gravelly fine<br>sandy loam.                                                            | SM-SC          | A-2      | 0                               | 65-85                                | 60-75  | 50-70  | 20-35  | 20-30                  | 5-10                     |
|                             | 5-11  | Very gravelly<br>clay loam, very<br>gravelly loam,<br>very gravelly<br>sandy clay loam. | GC             | A-2      | 0                               | 35-60                                | 25-50  | 20-40  | 15-35  | 30-40                  | 10-15                    |
|                             | 11-60 | Stratified very<br>gravelly sandy<br>loam to<br>extremely<br>gravelly sand.             | GP-GM, GM      | A-1      | 0-25                            | 30-60                                | 20-50  | 15-40  | 5-20   | ---                    | NP                       |
| 2640*:<br>Rasille-----      | 0-6   | Silt loam-----                                                                          | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 85-100 | 20-30                  | NP-5                     |
|                             | 6-15  | Silt loam, very<br>fine sandy loam.                                                     | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 75-100 | 20-30                  | NP-5                     |
|                             | 15-41 | Silt loam, very<br>fine sandy loam.                                                     | ML             | A-4      | 0                               | 100                                  | 100    | 95-100 | 75-100 | 20-30                  | NP-5                     |
|                             | 41-60 | Stratified fine<br>sandy loam to<br>very gravelly<br>coarse sand.                       | SM, GM         | A-1      | 0                               | 55-80                                | 50-75  | 15-35  | 10-20  | ---                    | NP                       |
| Kelk-----                   | 0-14  | Silt loam-----                                                                          | CL-ML, CL      | A-4, A-6 | 0                               | 95-100                               | 95-100 | 95-100 | 75-90  | 25-35                  | 5-15                     |
|                             | 14-51 | Silt loam-----                                                                          | CL-ML, CL      | A-4, A-6 | 0                               | 95-100                               | 95-100 | 95-100 | 85-95  | 25-35                  | 5-15                     |
|                             | 51-60 | Silt loam-----                                                                          | CL-ML, CL      | A-4, A-6 | 0                               | 95-100                               | 90-100 | 90-100 | 80-95  | 25-35                  | 5-15                     |
| 2652*:<br>Malpais-----      | 0-3   | Very gravelly<br>fine sandy loam.                                                       | GM             | A-1      | 0-5                             | 40-55                                | 30-45  | 25-40  | 15-25  | 20-30                  | NP-5                     |
|                             | 3-15  | Very gravelly<br>loam, very<br>gravelly sandy<br>loam, very<br>cobbly sandy<br>loam.    | GM             | A-1, A-2 | 5-35                            | 50-60                                | 35-50  | 30-45  | 20-35  | 20-25                  | NP-5                     |
|                             | 15-60 | Extremely cobbly<br>loam, very<br>cobbly loam,<br>extremely cobbly<br>sandy loam.       | GM             | A-1, A-2 | 40-50                           | 40-55                                | 35-50  | 25-35  | 20-30  | 20-25                  | NP-5                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                  | Classification  |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------|-----------------|------------------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                               | Unified         | AASHTO           |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                             | In    |                                                                               |                 |                  | Pct                             |                                      |        |       |       | Pct             |                          |
| 2652*:<br>Stingdorn-----    | 0-7   | Extremely cobbly<br>loam.                                                     | GM, GM-GC       | A-1, A-2         | 50-60                           | 45-60                                | 35-50  | 30-45 | 15-30 | 15-25           | NP-10                    |
|                             | 7-15  | Very cobbly clay<br>loam.                                                     | GC              | A-6              | 30-50                           | 60-75                                | 50-65  | 45-60 | 35-50 | 35-40           | 15-20                    |
|                             | 15-20 | Indurated-----                                                                | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                             | 20    | Unweathered<br>bedrock.                                                       | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 2670*:<br>Zoesta Variant--  | 0-8   | Gravelly loam----                                                             | GM, SM          | A-4              | 0-5                             | 65-80                                | 55-70  | 50-65 | 35-50 | 20-30           | NP-5                     |
|                             | 8-27  | Clay-----                                                                     | CH              | A-7              | 0                               | 85-95                                | 85-95  | 80-95 | 70-85 | 60-70           | 30-40                    |
|                             | 27-36 | Clay loam, clay                                                               | CL, CH          | A-7              | 0                               | 85-95                                | 85-95  | 80-90 | 65-80 | 45-55           | 20-30                    |
|                             | 36-60 | Gravelly loam,<br>gravelly sandy<br>loam.                                     | SM-SC           | A-2, A-4         | 0-5                             | 65-80                                | 55-70  | 40-55 | 25-40 | 25-30           | 5-10                     |
| Jung-----                   | 0-8   | Very gravelly<br>loam.                                                        | GM              | A-1, A-2         | 0-10                            | 50-60                                | 35-50  | 25-45 | 20-35 | 20-25           | NP-5                     |
|                             | 8-19  | Very cobbly clay<br>loam, very<br>cobbly clay,<br>very gravelly<br>clay loam. | GC              | A-7              | 15-40                           | 55-65                                | 50-60  | 40-50 | 35-45 | 40-55           | 20-30                    |
|                             | 19    | Unweathered<br>bedrock.                                                       | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| McVegas-----                | 0-5   | Very cobbly loam                                                              | SM              | A-4              | 35-45                           | 70-85                                | 55-70  | 50-65 | 35-50 | 15-25           | NP-5                     |
|                             | 5-19  | Very cobbly silty<br>clay, very<br>cobbly clay,<br>very cobbly clay<br>loam.  | CL, CH, GC      | A-7              | 30-40                           | 70-85                                | 65-75  | 50-70 | 45-70 | 40-55           | 20-30                    |
|                             | 19-22 | Cemented-----                                                                 | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                             | 22    | Unweathered<br>bedrock.                                                       | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 2681*:<br>Tessfive-----     | 0-6   | Gravelly loam----                                                             | SM-SC,<br>GM-GC | A-4              | 0-5                             | 65-80                                | 55-70  | 45-60 | 35-50 | 20-30           | 5-10                     |
|                             | 6-16  | Gravelly loam,<br>gravelly sandy<br>loam.                                     | SM-SC,<br>GM-GC | A-4, A-1,<br>A-2 | 0-5                             | 55-80                                | 50-70  | 35-60 | 20-50 | 20-30           | 5-10                     |
|                             | 16    | Unweathered<br>bedrock.                                                       | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Puett-----                  | 0-4   | Gravelly sandy<br>loam.                                                       | SM-SC           | A-2              | 0-5                             | 70-80                                | 60-70  | 45-55 | 20-35 | 20-30           | 5-10                     |
|                             | 4-15  | Coarse sandy<br>loam, gravelly<br>loam, sandy<br>loam.                        | SM, ML, GM      | A-1, A-2,<br>A-4 | 0                               | 55-95                                | 50-90  | 30-80 | 15-55 | ---             | NP                       |
|                             | 15-19 | Weathered bedrock                                                             | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Grina-----                  | 0-3   | Gravelly loam----                                                             | SM-SC, SC       | A-4, A-6         | 0-5                             | 70-85                                | 55-70  | 45-60 | 35-50 | 25-35           | 5-15                     |
|                             | 3-14  | Loam, silt loam,<br>silty clay loam.                                          | CL              | A-6, A-7         | 0                               | 90-100                               | 80-100 | 75-95 | 60-85 | 30-45           | 10-20                    |
|                             | 14-18 | Weathered bedrock                                                             | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth       | USDA texture                                                                 | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------------|------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                             |             |                                                                              | Unified                 | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                             | In          |                                                                              |                         |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 2711*:<br>Burrita-----      | 0-3         | Very cobbly loam                                                             | GM-GC                   | A-4      | 25-40                           | 60-70                                | 55-65  | 50-60 | 35-45 | 15-25           | 5-10                     |
|                             | 3-18        | Very cobbly clay,<br>very stony clay<br>loam, very<br>gravelly clay<br>loam. | GC, SC                  | A-2, A-7 | 10-55                           | 35-75                                | 30-55  | 25-50 | 20-45 | 40-55           | 20-30                    |
|                             | 18-22       | Unweathered<br>bedrock.                                                      | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Burnborough-----            | 0-16        | Very gravelly<br>loam.                                                       | SC, SM-SC               | A-2      | 5-10                            | 65-75                                | 40-55  | 30-45 | 25-35 | 20-35           | 5-15                     |
|                             | 16-60       | Very gravelly<br>loam, very<br>gravelly clay<br>loam.                        | GC, SC                  | A-2      | 15-25                           | 55-65                                | 35-60  | 20-35 | 15-30 | 25-40           | 10-20                    |
| 2712*:<br>Burrita-----      | 0-3         | Gravelly loam----                                                            | GM-GC,<br>SM-SC         | A-4      | 0-10                            | 60-80                                | 55-75  | 50-65 | 35-50 | 15-25           | 5-10                     |
|                             | 3-18        | Very cobbly clay,<br>very stony clay<br>loam, very<br>gravelly clay<br>loam. | GC                      | A-2, A-7 | 10-55                           | 40-65                                | 30-55  | 25-50 | 20-45 | 40-55           | 20-30                    |
|                             | 18          | Unweathered<br>bedrock.                                                      | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Alley-----                  | 0-3         | Loam-----                                                                    | CL-ML, ML               | A-4      | 0-5                             | 95-100                               | 85-95  | 75-95 | 50-70 | 20-30           | NP-10                    |
|                             | 3-16        | Gravelly clay<br>loam, gravelly<br>loam.                                     | SC, GC                  | A-6      | 0-10                            | 65-80                                | 55-75  | 50-65 | 35-50 | 30-40           | 10-20                    |
|                             | 16-40       | Gravelly loam,<br>gravelly sandy<br>loam.                                    | GM, GM-GC,<br>SM, SM-SC | A-2      | 0-10                            | 60-70                                | 50-60  | 35-45 | 25-35 | 20-30           | NP-10                    |
|                             | 40-60       | Very gravelly<br>sandy loam, very<br>gravelly loamy<br>sand.                 | GM                      | A-1      | 0-10                            | 30-55                                | 25-50  | 15-40 | 10-25 | ---             | NP                       |
| Newpass-----                | 0-5         | Loam-----                                                                    | ML, CL-ML,<br>CL        | A-4, A-6 | 0                               | 80-100                               | 75-100 | 60-80 | 50-70 | 20-35           | NP-15                    |
|                             | 5-17        | Clay, silty clay                                                             | CH                      | A-7      | 0-5                             | 85-100                               | 80-95  | 75-90 | 70-85 | 50-65           | 25-35                    |
|                             | 17-24       | Very cobbly silty<br>clay, gravelly<br>clay, very<br>gravelly clay.          | CH                      | A-7      | 15-60                           | 70-85                                | 55-75  | 50-70 | 50-65 | 50-65           | 25-35                    |
|                             | 24-34<br>34 | Cemented-----<br>Unweathered<br>bedrock.                                     | ---                     | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 2721*:<br>Burnborough-----  | 0-16        | Very gravelly<br>loam.                                                       | SC, SM-SC               | A-2      | 5-10                            | 65-75                                | 40-55  | 30-45 | 25-35 | 20-35           | 5-15                     |
|                             | 16-60       | Very gravelly<br>loam, very<br>gravelly clay<br>loam.                        | GC, SC                  | A-2      | 15-25                           | 55-65                                | 35-60  | 20-35 | 15-30 | 25-40           | 10-20                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol   | Depth | USDA texture                                                                                    | Classification |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-------------------------------|-------|-------------------------------------------------------------------------------------------------|----------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                               |       |                                                                                                 | Unified        | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                               | In    |                                                                                                 |                |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 2721*:<br>Sumine-----         | 0-10  | Very cobbly loam                                                                                | GM-GC          | A-2, A-4         | 30-55                           | 55-65                                | 50-60 | 40-55 | 30-45 | 20-30           | 5-10                     |
|                               | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.                 | GC             | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45           | 15-25                    |
|                               | 30-34 | Unweathered<br>bedrock.                                                                         | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Burrita-----                  | 0-3   | Very cobbly loam                                                                                | GM-GC          | A-4              | 25-40                           | 60-70                                | 55-65 | 50-60 | 35-45 | 15-25           | 5-10                     |
|                               | 3-18  | Very cobbly clay,<br>very stony clay<br>loam, very<br>gravelly clay<br>loam.                    | GC, SC         | A-2, A-7         | 10-55                           | 35-75                                | 30-55 | 25-50 | 20-45 | 40-55           | 20-30                    |
|                               | 18-22 | Unweathered<br>bedrock.                                                                         | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2760*:<br>Ginex-----          | 0-3   | Very gravelly<br>sandy loam.                                                                    | GM-GC          | A-2              | 0                               | 45-60                                | 30-50 | 20-40 | 10-25 | 15-25           | 5-10                     |
|                               | 3-18  | Very gravelly<br>loam, very<br>gravelly sandy<br>clay loam.                                     | GC             | A-2              | 0                               | 45-60                                | 30-50 | 25-45 | 20-35 | 25-35           | 10-15                    |
|                               | 18-22 | Weathered bedrock                                                                               | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Burrita-----                  | 0-7   | Very cobbly loam                                                                                | GM-GC          | A-4              | 25-40                           | 60-70                                | 55-65 | 50-60 | 35-45 | 15-25           | 5-10                     |
|                               | 7-14  | Very cobbly clay,<br>very stony clay<br>loam, very<br>gravelly clay<br>loam.                    | GC, SC         | A-2, A-7         | 10-55                           | 35-75                                | 30-55 | 25-50 | 20-45 | 40-55           | 20-30                    |
|                               | 14    | Unweathered<br>bedrock.                                                                         | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Burrita, south<br>aspect----- | 0-7   | Very cobbly loam                                                                                | GM-GC          | A-4              | 25-40                           | 60-70                                | 55-65 | 50-60 | 35-45 | 15-25           | 5-10                     |
|                               | 7-14  | Very cobbly clay,<br>very stony clay<br>loam, very<br>gravelly clay<br>loam.                    | GC, SC         | A-2, A-7         | 10-55                           | 35-75                                | 30-55 | 25-50 | 20-45 | 40-55           | 20-30                    |
|                               | 14    | Unweathered<br>bedrock.                                                                         | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2771*:<br>Kram-----           | 0-3   | Very gravelly<br>very fine sandy<br>loam.                                                       | GM             | A-1, A-2         | 10-15                           | 50-60                                | 35-50 | 30-50 | 20-30 | 15-25           | NP-5                     |
|                               | 3-10  | Very gravelly<br>loam, very<br>gravelly very<br>fine sandy loam,<br>extremely<br>gravelly loam. | GM             | A-1, A-2         | 0-15                            | 25-60                                | 15-55 | 15-45 | 10-30 | 15-25           | NP-5                     |
|                               | 10    | Unweathered<br>bedrock.                                                                         | ---            | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                            | Classification  |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------------------------|-----------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                                         | Unified         | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                             | In    |                                                                                                         |                 |          | Pct                             |                                      |       |       |       | Pct                    |                          |
| 2771*:<br>Hopeka-----       | 0-8   | Very gravelly<br>loam.                                                                                  | GC              | A-2      | 0-15                            | 40-55                                | 25-50 | 25-45 | 20-35 | 25-35                  | 10-15                    |
|                             | 8-12  | Unweathered<br>bedrock.                                                                                 | ---             | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Rock outcrop.               |       |                                                                                                         |                 |          |                                 |                                      |       |       |       |                        |                          |
| 2783*:<br>Desatoya, steep-  | 0-3   | Very gravelly<br>sandy loam.                                                                            | GM-GC,<br>SM-SC | A-2      | 0-10                            | 50-70                                | 35-50 | 25-40 | 15-30 | 20-30                  | 5-10                     |
|                             | 3-14  | Gravelly clay<br>loam, gravelly<br>clay.                                                                | GC              | A-7      | 0-5                             | 65-75                                | 55-70 | 50-60 | 40-50 | 40-50                  | 20-30                    |
|                             | 14-60 | Stratified<br>extremely<br>gravelly sandy<br>loam to very<br>gravelly loamy<br>sand.                    | GM              | A-1      | 25-35                           | 35-50                                | 25-45 | 15-30 | 10-15 | 15-25                  | NP-5                     |
| Spike-----                  | 0-2   | Very gravelly<br>sandy loam.                                                                            | GM-GC           | A-2      | 0-5                             | 50-65                                | 35-50 | 25-40 | 15-30 | 20-30                  | 5-10                     |
|                             | 2-6   | Very gravelly<br>clay, very<br>gravelly clay<br>loam, very<br>gravelly sandy<br>clay.                   | GC              | A-2      | 5-15                            | 50-65                                | 35-50 | 30-45 | 20-35 | 45-55                  | 25-30                    |
|                             | 6-60  | Extremely<br>gravelly sandy<br>clay loam,<br>extremely<br>gravelly clay<br>loam, very<br>gravelly loam. | GP-GC, GC       | A-2      | 10-25                           | 30-50                                | 10-35 | 5-30  | 5-20  | 25-35                  | 10-15                    |
| Desatoya-----               | 0-3   | Gravelly sandy<br>loam.                                                                                 | SM-SC           | A-2, A-4 | 0-10                            | 65-80                                | 50-75 | 45-60 | 25-40 | 20-30                  | 5-10                     |
|                             | 3-14  | Gravelly clay<br>loam, gravelly<br>clay.                                                                | GC              | A-7      | 0-5                             | 65-75                                | 55-70 | 50-60 | 40-50 | 40-50                  | 20-30                    |
|                             | 14-60 | Stratified<br>extremely<br>gravelly sandy<br>loam to very<br>gravelly loamy<br>sand.                    | GM              | A-1      | 25-35                           | 35-50                                | 25-45 | 15-30 | 10-15 | 15-25                  | NP-5                     |
| 2790*:<br>Old Camp-----     | 0-5   | Very gravelly<br>loam.                                                                                  | GM, GM-GC       | A-1, A-2 | 0-15                            | 50-60                                | 35-45 | 30-40 | 20-30 | 15-25                  | NP-10                    |
|                             | 5-11  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam.               | GC              | A-2, A-6 | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40                  | 15-25                    |
|                             | 11-15 | Unweathered<br>bedrock.                                                                                 | ---             | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                  | Classification       |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------------------------------------|----------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                               | Unified              | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                          | In    |                                                                               |                      |          | Pct                             |                                      |       |       |       | Pct             |                          |
| 2790*:<br>Minat-----     | 0-9   | Very gravelly loam.                                                           | GM-GC, GC            | A-2      | 5-10                            | 45-60                                | 35-50 | 30-45 | 20-35 | 25-35           | 5-15                     |
|                          | 9-27  | Very gravelly loam.                                                           | GC, GM-GC            | A-2      | 0-10                            | 45-60                                | 30-50 | 25-45 | 20-35 | 25-35           | 5-15                     |
|                          | 27-60 | Very gravelly loam, very gravelly fine sandy loam.                            | GM-GC, GC            | A-2      | 0-10                            | 45-60                                | 30-50 | 20-45 | 15-30 | 25-35           | 5-15                     |
| Osoll-----               | 0-5   | Gravelly loam----                                                             | GM-GC, CL-ML         | A-4      | 0                               | 60-80                                | 55-75 | 45-65 | 35-60 | 20-25           | 5-10                     |
|                          | 5-12  | Very gravelly loam, very gravelly fine sandy loam.                            | GM-GC                | A-2      | 10-25                           | 30-55                                | 25-50 | 20-50 | 10-35 | 20-25           | 5-10                     |
|                          | 12-35 | Indurated-----                                                                | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                          | 35    | Unweathered bedrock.                                                          | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2791*:<br>Old Camp-----  | 0-2   | Very cobbly loam                                                              | GM, GM-GC, SM, SM-SC | A-2, A-4 | 25-55                           | 60-70                                | 55-65 | 45-55 | 30-40 | 15-25           | NP-10                    |
|                          | 2-14  | Very cobbly clay loam, extremely stony sandy clay loam, very stony clay loam. | GC                   | A-2, A-6 | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40           | 15-25                    |
|                          | 14    | Unweathered bedrock.                                                          | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Colbar-----              | 0-3   | Very cobbly loam                                                              | CL-ML                | A-4      | 50-60                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30           | 5-10                     |
|                          | 3-22  | Cobbly loam, gravelly clay loam, cobbly clay loam.                            | CL                   | A-6      | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                          | 22-26 | Gravelly loam, cobbly loam.                                                   | SM-SC, CL-ML         | A-4      | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                          | 26-30 | Unweathered bedrock.                                                          | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Rock outcrop.            |       |                                                                               |                      |          |                                 |                                      |       |       |       |                 |                          |
| 2793*:<br>Old Camp-----  | 0-2   | Very cobbly loam                                                              | GM, GM-GC, SM, SM-SC | A-2, A-4 | 25-55                           | 60-70                                | 55-65 | 45-55 | 30-40 | 15-25           | NP-10                    |
|                          | 2-14  | Very cobbly clay loam, extremely stony sandy clay loam, very stony clay loam. | GC                   | A-2, A-6 | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40           | 15-25                    |
|                          | 14    | Unweathered bedrock.                                                          | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Laped-----               | 0-6   | Very cobbly loam                                                              | SM-SC, GM-GC         | A-4      | 30-50                           | 65-80                                | 50-70 | 45-60 | 35-50 | 20-30           | 5-10                     |
|                          | 6-18  | Gravelly clay loam.                                                           | GC, SC               | A-6, A-7 | 0-5                             | 60-80                                | 55-70 | 45-60 | 35-50 | 35-45           | 15-20                    |
|                          | 18-23 | Indurated-----                                                                | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                          | 23    | Unweathered bedrock.                                                          | ---                  | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol   | Depth | USDA texture                                                                              | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|----------------------------|-------|-------------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                            |       |                                                                                           | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                            | In    |                                                                                           |                         |          | Pct                             |                                      |       |       |       | Pct                    |                          |
| 2794*:<br>Old Camp-----    | 0-2   | Gravelly loam----                                                                         | SM-SC                   | A-4      | 0-5                             | 70-85                                | 60-75 | 50-65 | 35-50 | 25-30                  | 5-10                     |
|                            | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC                      | A-2, A-6 | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40                  | 15-25                    |
|                            | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Kram Variant----           | 0-3   | Very gravelly<br>loam.                                                                    | GC                      | A-2, A-6 | 5-10                            | 45-60                                | 35-50 | 30-45 | 25-40 | 25-35                  | 10-15                    |
|                            | 3-11  | Extremely<br>gravelly loam.                                                               | GC                      | A-2      | 5-10                            | 35-50                                | 20-30 | 15-25 | 10-20 | 25-35                  | 10-15                    |
|                            | 11    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Rock outcrop.              |       |                                                                                           |                         |          |                                 |                                      |       |       |       |                        |                          |
| 2796*:<br>Old Camp-----    | 0-2   | Gravelly loam----                                                                         | SM-SC                   | A-4      | 0-5                             | 70-85                                | 60-75 | 50-65 | 35-50 | 25-30                  | 5-10                     |
|                            | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC                      | A-2, A-6 | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40                  | 15-25                    |
|                            | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Osoll-----                 | 0-5   | Gravelly loam----                                                                         | GM-GC,<br>CL-ML         | A-4      | 0                               | 60-80                                | 55-75 | 45-65 | 35-60 | 20-25                  | 5-10                     |
|                            | 5-12  | Very gravelly<br>loam, very<br>gravelly fine<br>sandy loam.                               | GM-GC                   | A-2      | 10-25                           | 30-55                                | 25-50 | 20-50 | 10-35 | 20-25                  | 5-10                     |
|                            | 12-35 | Indurated-----                                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                            | 35    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Colbar-----                | 0-3   | Gravelly loam----                                                                         | SM-SC, SM,<br>GM, GM-GC | A-4      | 0-5                             | 65-85                                | 60-75 | 50-65 | 35-50 | 20-30                  | NP-10                    |
|                            | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                               | CL                      | A-6      | 10-35                           | 75-90                                | 70-85 | 60-80 | 50-65 | 30-40                  | 10-20                    |
|                            | 22-26 | Gravelly loam,<br>cobbly loam.                                                            | SM-SC,<br>CL-ML         | A-4      | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30                  | 5-10                     |
|                            | 26-30 | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 2797*:<br>Old Camp, steep- | 0-2   | Gravelly loam----                                                                         | SM-SC                   | A-4      | 0-5                             | 70-85                                | 60-75 | 50-65 | 35-50 | 25-30                  | 5-10                     |
|                            | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC                      | A-2, A-6 | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40                  | 15-25                    |
|                            | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                              | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                           | Unified                 | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                           |                         |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 2797*:<br>Colbar-----       | 0-3   | Cobbly loam-----                                                                          | CL-ML                   | A-4              | 35-45                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30           | 5-10                     |
|                             | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                               | CL                      | A-6              | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                             | 22-26 | Gravelly loam,<br>cobbly loam.                                                            | SM-SC,<br>CL-ML         | A-4              | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                             | 26-30 | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Old Camp-----               | 0-2   | Very cobbly loam                                                                          | GM, GM-GC,<br>SM, SM-SC | A-2, A-4         | 25-55                           | 60-70                                | 55-65 | 45-55 | 30-40 | 15-25           | NP-10                    |
|                             | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC                      | A-2, A-6         | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40           | 15-25                    |
|                             | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2798*:<br>Old Camp-----     | 0-2   | Gravelly loam-----                                                                        | SM-SC                   | A-4              | 0-5                             | 70-85                                | 60-75 | 50-65 | 35-50 | 25-30           | 5-10                     |
|                             | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC                      | A-2, A-6         | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40           | 15-25                    |
|                             | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Atlow-----                  | 0-3   | Very gravelly<br>loam.                                                                    | GC, SC                  | A-2, A-6         | 0-15                            | 35-85                                | 30-50 | 20-45 | 15-40 | 25-35           | 10-15                    |
|                             | 3-14  | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam.                                  | GC                      | A-2, A-6,<br>A-7 | 0-45                            | 35-60                                | 25-50 | 20-50 | 15-40 | 35-45           | 15-20                    |
|                             | 14-18 | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Osoll-----                  | 0-5   | Very gravelly<br>loam.                                                                    | GM-GC                   | A-4, A-2         | 0                               | 30-60                                | 25-50 | 20-50 | 15-40 | 20-25           | 5-10                     |
|                             | 5-12  | Very gravelly<br>loam, very<br>gravelly fine<br>sandy loam.                               | GM-GC                   | A-2              | 10-25                           | 30-55                                | 25-50 | 20-50 | 10-35 | 20-25           | 5-10                     |
|                             | 12-35 | Indurated-----                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 35    | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 2800*:<br>Old Camp-----     | 0-6   | Extremely<br>gravelly loam.                                                               | GM-GC                   | A-2              | 10-20                           | 25-40                                | 15-25 | 10-25 | 10-20 | 15-25           | 5-10                     |
|                             | 6-16  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>loam.      | GC                      | A-2, A-6         | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40           | 15-25                    |
|                             | 16    | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                          |       |                                                             | Unified                 | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                          | In    |                                                             |                         |                  | Pct                             |                                      |       |       |       | Pct                    |                          |
| 2800*:<br>Walti-----     | 0-4   | Very cobbly loam                                            | CL-ML, ML               | A-4              | 30-40                           | 75-90                                | 65-80 | 55-70 | 50-60 | 20-30                  | NP-10                    |
|                          | 4-10  | Clay loam,<br>gravelly clay<br>loam.                        | CL                      | A-6              | 0-10                            | 90-100                               | 65-90 | 60-80 | 50-65 | 35-40                  | 15-20                    |
|                          | 10-30 | Clay, gravelly<br>clay.                                     | CH, MH                  | A-7              | 0-10                            | 90-100                               | 65-90 | 60-80 | 50-75 | 55-65                  | 25-35                    |
|                          | 30-34 | Unweathered<br>bedrock.                                     | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Softscrabble----         | 0-16  | Very cobbly loam                                            | GM-GC, GC,<br>SM-SC     | A-4              | 40-50                           | 65-80                                | 60-75 | 50-65 | 35-50 | 20-30                  | 5-10                     |
|                          | 16-30 | Very cobbly clay<br>loam.                                   | GC                      | A-6, A-7         | 30-45                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-45                  | 15-20                    |
|                          | 30-60 | Very gravelly<br>clay loam.                                 | GC                      | A-2, A-6,<br>A-7 | 0-5                             | 45-60                                | 35-50 | 30-45 | 25-40 | 35-45                  | 15-20                    |
| 2801*:<br>Old Camp-----  | 0-3   | Very cobbly loam                                            | GM-GC, GC,<br>SM-SC, SC | A-2, A-4,<br>A-6 | 35-50                           | 60-75                                | 50-65 | 45-60 | 30-45 | 25-35                  | 5-15                     |
|                          | 3-15  | Very cobbly clay<br>loam.                                   | GC, SC                  | A-2, A-6         | 35-50                           | 60-75                                | 50-65 | 45-60 | 30-45 | 35-40                  | 15-20                    |
|                          | 15    | Unweathered<br>bedrock.                                     | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Rock outcrop.            |       |                                                             |                         |                  |                                 |                                      |       |       |       |                        |                          |
| Colbar-----              | 0-3   | Very cobbly loam                                            | CL-ML                   | A-4              | 50-60                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30                  | 5-10                     |
|                          | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam. | CL                      | A-6              | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40                  | 10-20                    |
|                          | 22-26 | Gravelly loam,<br>cobbly loam.                              | SM-SC,<br>CL-ML         | A-4              | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30                  | 5-10                     |
|                          | 26-30 | Unweathered<br>bedrock.                                     | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 2802*:<br>Old Camp-----  | 0-3   | Extremely cobbly<br>loam.                                   | GM-GC, GC               | A-2              | 50-60                           | 50-60                                | 35-50 | 30-45 | 20-35 | 25-35                  | 5-15                     |
|                          | 3-15  | Very cobbly clay<br>loam.                                   | GC, SC                  | A-2, A-6         | 35-50                           | 60-75                                | 50-65 | 45-60 | 30-45 | 35-40                  | 15-20                    |
|                          | 15    | Unweathered<br>bedrock.                                     | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Rock outcrop.            |       |                                                             |                         |                  |                                 |                                      |       |       |       |                        |                          |
| Colbar-----              | 0-3   | Very cobbly loam                                            | CL-ML                   | A-4              | 50-60                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30                  | 5-10                     |
|                          | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam. | CL                      | A-6              | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40                  | 10-20                    |
|                          | 22-26 | Gravelly loam,<br>cobbly loam.                              | SM-SC,<br>CL-ML         | A-4              | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30                  | 5-10                     |
|                          | 26-30 | Unweathered<br>bedrock.                                     | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                    | Classification  |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|---------------------------------------------------------------------------------|-----------------|------------------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                                 | Unified         | AASHTO           |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                          | In    |                                                                                 |                 |                  | Pct                             |                                      |        |       |       | Pct             |                          |
| 3071*:<br>Allor-----     | 0-12  | Gravelly loam----                                                               | SM-SC           | A-2, A-4         | 5-10                            | 70-80                                | 55-75  | 45-65 | 30-45 | 20-30           | 5-10                     |
|                          | 12-34 | Gravelly clay<br>loam, gravelly<br>sandy clay loam.                             | SC              | A-6, A-7         | 0-10                            | 70-85                                | 55-75  | 45-65 | 35-50 | 35-45           | 15-20                    |
|                          | 34-60 | Gravelly loamy<br>sand, very<br>gravelly loamy<br>sand.                         | SM              | A-1              | 0-10                            | 55-75                                | 45-65  | 30-50 | 10-20 | ---             | NP                       |
| Wieland-----             | 0-8   | Gravelly loam----                                                               | GC, CL, SC      | A-6              | 0-5                             | 60-85                                | 50-75  | 45-70 | 35-60 | 25-35           | 10-15                    |
|                          | 8-20  | Gravelly clay,<br>clay.                                                         | CH, SC          | A-7              | 0-5                             | 75-95                                | 55-90  | 50-80 | 45-75 | 50-60           | 25-35                    |
|                          | 20-60 | Loam, gravelly<br>loam, gravelly<br>sandy loam.                                 | CL-ML,<br>SM-SC | A-4, A-2         | 0-5                             | 65-95                                | 55-90  | 40-85 | 25-70 | 20-30           | 5-10                     |
| 3111*:<br>Ninemile-----  | 0-9   | Extremely cobbly<br>loam.                                                       | GM-GC           | A-4, A-2         | 45-65                           | 30-50                                | 30-45  | 25-45 | 20-40 | 25-30           | 5-10                     |
|                          | 9-19  | Clay, gravelly<br>clay.                                                         | CH              | A-7              | 0-15                            | 70-100                               | 65-100 | 60-90 | 50-80 | 55-65           | 30-35                    |
|                          | 19-23 | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Zoesta-----              | 0-7   | Cobbly loam-----                                                                | CL-ML, ML       | A-4              | 25-40                           | 80-90                                | 75-90  | 65-80 | 50-65 | 20-30           | NP-10                    |
|                          | 7-23  | Clay-----                                                                       | CL, CH          | A-7              | 0-10                            | 90-100                               | 85-95  | 75-90 | 65-80 | 45-60           | 20-30                    |
|                          | 23-31 | Gravelly clay<br>loam, gravelly<br>clay.                                        | GC, CL          | A-6, A-7         | 0                               | 60-75                                | 55-70  | 50-65 | 40-55 | 35-50           | 15-25                    |
|                          | 31-60 | Very gravelly<br>clay loam, very<br>gravelly loam.                              | GC              | A-2              | 0                               | 45-55                                | 30-45  | 25-40 | 20-35 | 30-40           | 10-15                    |
| Itca-----                | 0-9   | Extremely stony<br>loam.                                                        | GM-GC, GC       | A-4, A-6         | 30-50                           | 60-75                                | 50-65  | 45-60 | 35-50 | 25-35           | 5-15                     |
|                          | 9-17  | Very cobbly clay<br>loam, very<br>gravelly clay,<br>extremely<br>gravelly clay. | CL, GC          | A-7, A-2         | 0-55                            | 40-80                                | 30-75  | 25-70 | 20-60 | 40-50           | 15-25                    |
|                          | 17-21 | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 3121*:<br>Walti-----     | 0-4   | Extremely cobbly<br>loam.                                                       | GM-GC           | A-2              | 50-60                           | 40-55                                | 25-40  | 20-35 | 15-30 | 20-30           | 5-10                     |
|                          | 4-10  | Clay loam,<br>gravelly clay<br>loam.                                            | CL              | A-6              | 0-10                            | 90-100                               | 65-90  | 60-80 | 50-65 | 35-40           | 15-20                    |
|                          | 10-30 | Gravelly clay,<br>clay.                                                         | CH, MH          | A-7              | 0-10                            | 90-100                               | 65-90  | 60-80 | 50-75 | 55-65           | 25-35                    |
|                          | 30-34 | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Softscrabble----         | 0-16  | Very cobbly loam                                                                | GM-GC,<br>SM-SC | A-4              | 40-50                           | 65-80                                | 60-75  | 50-65 | 35-50 | 20-30           | 5-10                     |
|                          | 16-30 | Very cobbly clay<br>loam.                                                       | GC              | A-6, A-7         | 30-45                           | 60-75                                | 50-65  | 45-60 | 35-50 | 35-45           | 15-20                    |
|                          | 30-60 | Very gravelly<br>clay loam.                                                     | GC              | A-2, A-6,<br>A-7 | 0-5                             | 45-60                                | 35-50  | 30-45 | 25-40 | 35-45           | 15-20                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                         | Classification            |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|--------------------------------------------------------------------------------------|---------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                      | Unified                   | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                             | In    |                                                                                      |                           |                  | Pct                             |                                      |       |       |       |                        |                          |
| 3121*:<br>Bucan-----        | 0-5   | Very cobbly loam                                                                     | GC, CL                    | A-6              | 25-50                           | 55-70                                | 50-65 | 45-60 | 35-55 | 30-35                  | 10-15                    |
|                             | 5-30  | Clay-----                                                                            | CH                        | A-7              | 0-10                            | 85-95                                | 80-90 | 75-85 | 65-75 | 50-60                  | 35-45                    |
|                             | 30-52 | Cobbly clay,<br>gravelly clay<br>loam, gravelly<br>clay.                             | CL                        | A-7              | 10-30                           | 75-90                                | 70-85 | 60-70 | 50-60 | 40-50                  | 25-35                    |
|                             | 52-56 | Unweathered<br>bedrock.                                                              | ---                       | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 3122*:<br>Walti-----        | 0-4   | Gravelly loam----                                                                    | SM-SC,<br>GM-GC,<br>CL-ML | A-4              | 5-10                            | 65-80                                | 55-75 | 40-60 | 35-55 | 20-30                  | 5-10                     |
|                             | 4-10  | Clay loam,<br>gravelly clay<br>loam.                                                 | CL                        | A-6              | 0-10                            | 90-100                               | 65-90 | 60-80 | 50-65 | 35-40                  | 15-20                    |
|                             | 10-30 | Clay, gravelly<br>clay.                                                              | CH, MH                    | A-7              | 0-10                            | 90-100                               | 65-90 | 60-80 | 50-75 | 55-65                  | 25-35                    |
|                             | 30-34 | Unweathered<br>bedrock.                                                              | ---                       | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Sumine-----                 | 0-10  | Cobbly loam-----                                                                     | CL-ML                     | A-4              | 20-30                           | 80-90                                | 75-85 | 65-75 | 50-65 | 20-30                  | 5-10                     |
|                             | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.      | GC                        | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45                  | 15-25                    |
|                             | 30-34 | Unweathered<br>bedrock.                                                              | ---                       | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Softscrabble----            | 0-16  | Cobbly loam-----                                                                     | SM-SC                     | A-4              | 25-40                           | 75-90                                | 70-85 | 55-70 | 35-50 | 20-30                  | 5-10                     |
|                             | 16-30 | Very cobbly clay<br>loam.                                                            | GC                        | A-6, A-7         | 30-45                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-45                  | 15-20                    |
|                             | 30-60 | Very gravelly<br>clay loam.                                                          | GC                        | A-2, A-6,<br>A-7 | 0-5                             | 45-60                                | 35-50 | 30-45 | 25-40 | 35-45                  | 15-20                    |
| 3127*:<br>Walti-----        | 0-5   | Cobbly loam-----                                                                     | CL-ML                     | A-4              | 25-40                           | 70-85                                | 65-80 | 55-70 | 50-60 | 20-30                  | 5-10                     |
|                             | 5-9   | Clay loam,<br>gravelly clay<br>loam.                                                 | CL                        | A-6              | 0-10                            | 90-100                               | 65-90 | 60-80 | 50-65 | 35-40                  | 15-20                    |
|                             | 9-22  | Clay, gravelly<br>clay.                                                              | CH, MH                    | A-7              | 0-10                            | 90-100                               | 65-90 | 60-80 | 50-75 | 55-65                  | 25-35                    |
|                             | 22    | Unweathered<br>bedrock.                                                              | ---                       | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Cleavage-----               | 0-4   | Extremely<br>gravelly loam.                                                          | GM-GC                     | A-2              | 0-10                            | 35-45                                | 15-25 | 10-25 | 10-20 | 25-30                  | 5-10                     |
|                             | 4-15  | Very cobbly clay<br>loam, extremely<br>gravelly clay<br>loam, very<br>gravelly loam. | GC                        | A-2              | 0-45                            | 40-55                                | 30-45 | 25-45 | 20-35 | 30-45                  | 10-20                    |
|                             | 15-19 | Unweathered<br>bedrock.                                                              | ---                       | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                              | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                           | Unified                 | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                           |                         |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 3127*:<br>Softscrabble----  | 0-9   | Gravelly loam----                                                                         | SM-SC                   | A-4              | 0-5                             | 70-85                                | 55-70 | 45-60 | 35-50 | 20-30           | 5-10                     |
|                             | 9-30  | Very cobbly clay<br>loam.                                                                 | GC                      | A-6, A-7         | 30-45                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-45           | 15-20                    |
|                             | 30-60 | Gravelly clay<br>loam.                                                                    | GC, CL                  | A-6, A-7         | 5-10                            | 65-80                                | 55-70 | 50-65 | 40-55 | 35-45           | 15-20                    |
| 3134*:<br>Itca-----         | 0-9   | Extremely cobbly<br>fine sandy loam.                                                      | SM-SC                   | A-2              | 55-65                           | 60-75                                | 45-55 | 35-50 | 20-35 | 20-30           | 5-10                     |
|                             | 9-17  | Very gravelly<br>clay, very<br>gravelly clay<br>loam.                                     | GC                      | A-7, A-2         | 10-20                           | 50-65                                | 40-50 | 35-45 | 25-40 | 40-50           | 15-25                    |
|                             | 17-21 | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Clanalpine-----             | 0-12  | Extremely cobbly<br>loam.                                                                 | GM-GC                   | A-2              | 45-55                           | 35-45                                | 25-35 | 20-30 | 15-25 | 20-25           | 5-10                     |
|                             | 12-38 | Very cobbly loam,<br>very cobbly clay<br>loam, very<br>gravelly clay<br>loam.             | GC                      | A-2, A-6         | 15-35                           | 50-70                                | 35-60 | 25-50 | 20-40 | 30-40           | 10-20                    |
|                             | 38-42 | Weathered bedrock                                                                         | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Sumine-----                 | 0-10  | Very gravelly<br>loam.                                                                    | GM-GC                   | A-2, A-4         | 10-15                           | 50-65                                | 45-60 | 40-50 | 30-40 | 20-30           | 5-10                     |
|                             | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.           | GC                      | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45           | 15-25                    |
|                             | 30-34 | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3150*:<br>Robson-----       | 0-5   | Very gravelly<br>loam.                                                                    | GM-GC, GC               | A-2              | 5-15                            | 40-50                                | 30-40 | 20-35 | 15-30 | 25-35           | 5-15                     |
|                             | 5-15  | Very cobbly clay,<br>extremely cobbly<br>clay.                                            | GC, GM                  | A-7              | 50-80                           | 60-70                                | 50-65 | 40-55 | 35-50 | 45-55           | 20-25                    |
|                             | 15-19 | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Wiskan-----                 | 0-16  | Gravelly loam----                                                                         | SM, CL-ML,<br>SM-SC, ML | A-4              | 0-15                            | 70-85                                | 60-75 | 55-75 | 40-60 | 20-30           | NP-10                    |
|                             | 16-28 | Very gravelly<br>clay loam, very<br>gravelly loam,<br>extremely<br>gravelly clay<br>loam. | GC                      | A-2              | 10-25                           | 40-55                                | 30-45 | 25-45 | 20-35 | 30-40           | 10-20                    |
|                             | 28    | Unweathered<br>bedrock.                                                                   | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                              | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                          |       |                                                                                           | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                          | In    |                                                                                           |                         |          | Pct                             |                                      |       |       |       |                        |                          |
| 3152*:<br>Robson-----    | 0-7   | Cobbly loam-----                                                                          | SM-SC, SC,<br>CL-ML, CL | A-4, A-6 | 15-45                           | 90-95                                | 65-95 | 55-65 | 45-60 | 25-35                  | 5-15                     |
|                          | 7-19  | Very cobbly clay,<br>extremely cobbly<br>clay.                                            | GC                      | A-7      | 50-80                           | 60-70                                | 50-65 | 40-55 | 35-50 | 45-55                  | 20-30                    |
|                          | 19    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Reluctan-----            | 0-8   | Very cobbly loam                                                                          | GM-GC                   | A-2, A-4 | 30-50                           | 55-65                                | 45-60 | 40-55 | 30-45 | 25-30                  | 5-10                     |
|                          | 8-33  | Gravelly loam,<br>gravelly clay<br>loam.                                                  | GC, CL                  | A-6, A-7 | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45                  | 15-20                    |
|                          | 33-37 | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 3156*:<br>Robson-----    | 0-10  | Extremely cobbly<br>loam.                                                                 | GM-GC, GC               | A-2      | 45-55                           | 30-45                                | 20-35 | 15-35 | 10-25 | 25-35                  | 5-15                     |
|                          | 10-14 | Very cobbly clay<br>loam.                                                                 | GC                      | A-7      | 30-45                           | 55-75                                | 50-60 | 40-60 | 35-50 | 40-45                  | 15-20                    |
|                          | 14-19 | Very cobbly clay,<br>extremely cobbly<br>clay.                                            | GC, GM                  | A-7      | 50-80                           | 60-70                                | 50-65 | 40-55 | 35-50 | 45-55                  | 20-25                    |
|                          | 19    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Old Camp-----            | 0-2   | Very cobbly loam                                                                          | GM, GM-GC,<br>SM, SM-SC | A-2, A-4 | 25-55                           | 60-70                                | 55-65 | 45-55 | 30-40 | 15-25                  | NP-10                    |
|                          | 2-14  | Very cobbly clay<br>loam, extremely<br>stony sandy clay<br>loam, very stony<br>clay loam. | GC                      | A-2, A-6 | 35-50                           | 40-55                                | 35-50 | 30-45 | 25-40 | 30-40                  | 15-25                    |
|                          | 14    | Unweathered<br>bedrock.                                                                   | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Rock outcrop.            |       |                                                                                           |                         |          |                                 |                                      |       |       |       |                        |                          |
| 3203*:<br>Dewar-----     | 0-4   | Very gravelly<br>loam.                                                                    | GC                      | A-2      | 0                               | 35-60                                | 25-50 | 20-40 | 15-30 | 25-35                  | 10-15                    |
|                          | 4-14  | Gravelly silty<br>clay loam,<br>gravelly clay<br>loam.                                    | GC, CL                  | A-6, A-7 | 0-10                            | 65-90                                | 60-80 | 55-80 | 45-75 | 35-45                  | 15-20                    |
|                          | 14-50 | Indurated-----                                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Sodhouse-----            | 0-3   | Gravelly very<br>fine sandy loam.                                                         | SM                      | A-2, A-4 | 0-10                            | 65-75                                | 55-65 | 45-65 | 30-40 | 15-25                  | NP-5                     |
|                          | 3-17  | Fine sandy loam,<br>very fine sandy<br>loam.                                              | ML, SM                  | A-4      | 0                               | 80-100                               | 75-90 | 65-85 | 35-55 | 15-25                  | NP-5                     |
|                          | 17-29 | Indurated-----                                                                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
|                          | 29-60 | Extremely<br>gravelly sandy<br>loam, very<br>gravelly loamy<br>sand.                      | GM, GP-GM               | A-1      | 5-20                            | 25-60                                | 15-50 | 10-40 | 5-25  | ---                    | NP                       |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                       | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|----------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                    | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                    |                         |          | Pct                             |                                      |       |       |       | Pct             |                          |
| 3203*:<br>Bojo-----         | 0-4   | Gravelly loam----                                  | CL-ML                   | A-4      | 25-40                           | 70-85                                | 65-80 | 65-80 | 50-65 | 20-30           | 5-10                     |
|                             | 4-10  | Sandy clay loam,<br>clay loam.                     | SC                      | A-6      | 0-5                             | 90-100                               | 75-90 | 55-70 | 35-50 | 30-40           | 10-20                    |
|                             | 10    | Unweathered<br>bedrock.                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3410*:<br>Zoesta-----       | 0-7   | Cobbly loam-----                                   | CL-ML, ML               | A-4      | 25-40                           | 80-90                                | 75-90 | 65-80 | 50-65 | 20-30           | NP-10                    |
|                             | 7-23  | Clay-----                                          | CL, CH                  | A-7      | 0-10                            | 90-100                               | 85-95 | 75-90 | 65-80 | 45-60           | 20-30                    |
|                             | 23-31 | Gravelly clay<br>loam, gravelly<br>clay.           | GC, CL                  | A-6, A-7 | 0                               | 60-75                                | 55-70 | 50-65 | 40-55 | 35-50           | 15-25                    |
|                             | 31-60 | Very gravelly<br>clay loam, very<br>gravelly loam. | GC                      | A-2      | 0                               | 45-55                                | 30-45 | 25-40 | 20-35 | 30-40           | 10-15                    |
| Wieland-----                | 0-8   | Gravelly loam----                                  | GC, CL, SC              | A-6      | 0-5                             | 60-85                                | 50-75 | 45-70 | 35-60 | 25-35           | 10-15                    |
|                             | 8-20  | Gravelly clay,<br>clay.                            | CH, SC                  | A-7      | 0-5                             | 75-95                                | 55-90 | 50-80 | 45-75 | 50-60           | 25-35                    |
|                             | 20-60 | Loam, gravelly<br>loam, gravelly<br>sandy loam.    | CL-ML,<br>SM-SC         | A-4, A-2 | 0-5                             | 65-95                                | 55-90 | 40-85 | 25-70 | 20-30           | 5-10                     |
| Akerue-----                 | 0-3   | Gravelly loam----                                  | GC, GM-GC,<br>SC, SM-SC | A-4, A-6 | 0-5                             | 65-80                                | 55-70 | 45-60 | 35-50 | 25-35           | 5-15                     |
|                             | 3-15  | Very cobbly clay,<br>very cobbly clay<br>loam.     | GC, CL, SC              | A-7      | 30-50                           | 65-80                                | 55-75 | 50-70 | 40-55 | 40-50           | 15-25                    |
|                             | 15-21 | Indurated-----                                     | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 21-25 | Unweathered<br>bedrock.                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3413*:<br>Zoesta-----       | 0-7   | Cobbly loam-----                                   | CL-ML, ML               | A-4      | 25-40                           | 80-90                                | 75-90 | 65-80 | 50-65 | 20-30           | NP-10                    |
|                             | 7-23  | Clay-----                                          | CL, CH                  | A-7      | 0-10                            | 90-100                               | 85-95 | 75-90 | 65-80 | 45-60           | 20-30                    |
|                             | 23-31 | Gravelly clay<br>loam, gravelly<br>clay.           | GC, CL                  | A-6, A-7 | 0                               | 60-75                                | 55-70 | 50-65 | 40-55 | 35-50           | 15-25                    |
|                             | 31-60 | Very gravelly<br>clay loam, very<br>gravelly loam. | GC                      | A-2      | 0                               | 45-55                                | 30-45 | 25-40 | 20-35 | 30-40           | 10-15                    |
| Reluctan-----               | 0-9   | Gravelly loam----                                  | SM-SC,<br>CL-ML         | A-4      | 5-10                            | 70-80                                | 60-75 | 50-65 | 40-55 | 25-30           | 5-10                     |
|                             | 9-27  | Gravelly clay<br>loam, gravelly<br>loam.           | GC, CL                  | A-6, A-7 | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45           | 15-20                    |
|                             | 27    | Unweathered<br>bedrock.                            | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3415*:<br>Zoesta-----       | 0-7   | Cobbly loam-----                                   | CL-ML, ML               | A-4      | 25-40                           | 80-90                                | 75-90 | 65-80 | 50-65 | 20-30           | NP-10                    |
|                             | 7-23  | Clay-----                                          | CL, CH                  | A-7      | 0-10                            | 90-100                               | 85-95 | 75-90 | 65-80 | 45-60           | 20-30                    |
|                             | 23-31 | Gravelly clay<br>loam, gravelly<br>clay.           | GC, CL                  | A-6, A-7 | 0                               | 60-75                                | 55-70 | 50-65 | 40-55 | 35-50           | 15-25                    |
|                             | 31-60 | Very gravelly<br>clay loam, very<br>gravelly loam. | GC                      | A-2      | 0                               | 45-55                                | 30-45 | 25-40 | 20-35 | 30-40           | 10-15                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                          | Classification             |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------------|----------------------------|------------------|---------------------------------|--------------------------------------|--------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                       | Unified                    | AASHTO           |                                 | 4                                    | 10     | 40    | 200   |                        |                          |
|                             | In    |                                                                                       |                            |                  | Pct                             |                                      |        |       |       |                        |                          |
| 3415*:<br>Handy-----        | 0-4   | Gravelly loam----                                                                     | SM-SC,<br>GM-GC,<br>SC, GC | A-4, A-6         | 10-25                           | 65-80                                | 55-70  | 45-60 | 35-50 | 25-35                  | 5-15                     |
|                             | 4-30  | Gravelly clay,<br>clay.                                                               | CL, CH                     | A-7              | 0-5                             | 80-100                               | 70-90  | 65-80 | 55-70 | 45-55                  | 20-30                    |
|                             | 30-60 | Gravelly loam----                                                                     | SM-SC,<br>GM-GC            | A-4              | 0-10                            | 65-80                                | 55-70  | 50-65 | 35-50 | 20-30                  | 5-10                     |
| 3417*:<br>Zoesta-----       | 0-7   | Cobbly loam-----                                                                      | CL-ML, ML                  | A-4              | 25-40                           | 80-90                                | 75-90  | 65-80 | 50-65 | 20-30                  | NP-10                    |
|                             | 7-23  | Clay-----                                                                             | CL, CH                     | A-7              | 0-10                            | 90-100                               | 85-95  | 75-90 | 65-80 | 45-60                  | 20-30                    |
|                             | 23-31 | Gravelly clay<br>loam, gravelly<br>clay.                                              | GC, CL                     | A-6, A-7         | 0                               | 60-75                                | 55-70  | 50-65 | 40-55 | 35-50                  | 15-25                    |
|                             | 31-60 | Very gravelly<br>clay loam, very<br>gravelly loam.                                    | GC                         | A-2              | 0                               | 45-55                                | 30-45  | 25-40 | 20-35 | 30-40                  | 10-15                    |
| Loncan-----                 | 0-14  | Gravelly silt<br>loam.                                                                | GC, CL                     | A-6              | 0-15                            | 65-80                                | 60-75  | 50-70 | 35-60 | 30-35                  | 10-15                    |
|                             | 14-31 | Very gravelly<br>loam, extremely<br>cobbly loam,<br>very gravelly<br>sandy clay loam. | GC                         | A-2              | 10-55                           | 35-60                                | 30-50  | 25-40 | 20-35 | 30-35                  | 10-15                    |
|                             | 31    | Unweathered<br>bedrock.                                                               | ---                        | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Welch-----                  | 0-4   | Silt loam-----                                                                        | CL-ML                      | A-4              | 0                               | 95-100                               | 95-100 | 85-95 | 60-70 | 25-30                  | 5-10                     |
|                             | 4-60  | Stratified sandy<br>loam to silty<br>clay loam.                                       | CL                         | A-6, A-7         | 0                               | 80-100                               | 75-100 | 65-90 | 50-70 | 35-45                  | 15-20                    |
| 3420*:<br>Belate-----       | 0-14  | Gravelly loam----                                                                     | SM-SC,<br>CL-ML            | A-4              | 5-10                            | 75-85                                | 60-75  | 55-70 | 45-60 | 20-25                  | 5-10                     |
|                             | 14-60 | Very gravelly<br>clay loam, very<br>gravelly loam.                                    | GC                         | A-2, A-6         | 5-10                            | 50-65                                | 35-50  | 35-45 | 30-40 | 25-35                  | 10-15                    |
| Sumine-----                 | 0-10  | Very gravelly<br>loam.                                                                | GM-GC                      | A-2, A-4         | 10-15                           | 50-65                                | 45-60  | 40-50 | 30-40 | 20-30                  | 5-10                     |
|                             | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.       | GC                         | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65  | 30-50 | 25-45 | 35-45                  | 15-25                    |
|                             | 30-34 | Unweathered<br>bedrock.                                                               | ---                        | ---              | ---                             | ---                                  | ---    | ---   | ---   | ---                    | ---                      |
| Softscrabble----            | 0-16  | Very cobbly loam                                                                      | GM-GC,<br>SM-SC            | A-4              | 40-50                           | 65-80                                | 60-75  | 50-65 | 35-50 | 20-30                  | 5-10                     |
|                             | 16-30 | Very cobbly clay<br>loam.                                                             | GC                         | A-6, A-7         | 30-45                           | 60-75                                | 50-65  | 45-60 | 35-50 | 35-45                  | 15-20                    |
|                             | 30-60 | Very gravelly<br>clay loam.                                                           | GC                         | A-2, A-6,<br>A-7 | 0-5                             | 45-60                                | 35-50  | 30-45 | 25-40 | 35-45                  | 15-20                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                        | Classification       |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------------------------------------------|----------------------|---------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                                     | Unified              | AASHTO        |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                          | In    |                                                                                     |                      |               | Pct                             |                                      |       |       |       | Pct             |                          |
| 3423*:<br>Belate-----    | 0-14  | Very gravelly loam.                                                                 | GM-GC                | A-2           | 5-15                            | 50-65                                | 35-50 | 30-40 | 25-35 | 20-25           | 5-10                     |
|                          | 14-60 | Very gravelly clay loam, very gravelly loam.                                        | GC                   | A-2, A-6      | 5-10                            | 50-65                                | 35-50 | 35-45 | 30-40 | 25-35           | 10-15                    |
| Cleavage-----            | 0-4   | Extremely gravelly loam.                                                            | GM-GC                | A-2           | 0-10                            | 35-45                                | 15-25 | 10-25 | 10-20 | 25-30           | 5-10                     |
|                          | 4-15  | Very cobbly clay loam, extremely gravelly clay loam, very gravelly loam.            | GC                   | A-2           | 0-45                            | 40-55                                | 30-45 | 25-45 | 20-35 | 30-45           | 10-20                    |
|                          | 15-19 | Unweathered bedrock.                                                                | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Softscrabble----         | 0-9   | Gravelly loam----                                                                   | SM-SC                | A-4           | 0-5                             | 70-85                                | 55-70 | 45-60 | 35-50 | 20-30           | 5-10                     |
|                          | 9-30  | Very cobbly clay loam.                                                              | GC                   | A-6, A-7      | 30-45                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-45           | 15-20                    |
|                          | 30-60 | Gravelly clay loam.                                                                 | GC, CL               | A-6, A-7      | 5-10                            | 65-80                                | 55-70 | 50-65 | 40-55 | 35-45           | 15-20                    |
| 3432*:<br>Bregar-----    | 0-4   | Very cobbly loam                                                                    | GC, GM-GC, CL, CL-ML | A-2, A-4, A-6 | 30-50                           | 50-75                                | 45-70 | 40-65 | 30-55 | 20-35           | 5-15                     |
|                          | 4-11  | Very gravelly clay loam, extremely gravelly loam, extremely cobbly sandy clay loam. | GC                   | A-2           | 0-40                            | 25-60                                | 20-50 | 15-45 | 15-35 | 35-45           | 15-25                    |
|                          | 11-15 | Unweathered bedrock.                                                                | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Roca-----                | 0-5   | Very gravelly loam.                                                                 | GC                   | A-2           | 0-10                            | 35-60                                | 30-50 | 25-40 | 20-35 | 25-35           | 10-15                    |
|                          | 5-27  | Very gravelly clay loam, very gravelly clay.                                        | GC, SC               | A-2           | 0-15                            | 60-75                                | 40-50 | 30-45 | 25-35 | 45-60           | 25-35                    |
|                          | 27-31 | Unweathered bedrock.                                                                | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Quarz-----               | 0-7   | Extremely gravelly loam.                                                            | GP-GC, GC            | A-2           | 0-15                            | 20-35                                | 10-25 | 10-20 | 5-15  | 25-35           | 10-15                    |
|                          | 7-26  | Very gravelly clay, very gravelly clay loam.                                        | GC                   | A-2, A-7      | 0-25                            | 30-55                                | 25-50 | 20-45 | 15-40 | 45-60           | 20-30                    |
|                          | 26-30 | Unweathered bedrock.                                                                | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                       | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|----------------------------------------------------------------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|------------------------|--------------------------|
|                             |       |                                                                                                    | Unified                 | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                        |                          |
|                             | In    |                                                                                                    |                         |                  | Pct                             |                                      |       |       |       |                        |                          |
| 3433*:<br>Bregar-----       | 0-4   | Very gravelly<br>loam.                                                                             | GM-GC, GC               | A-2, A-4,<br>A-6 | 10-20                           | 55-70                                | 40-55 | 35-50 | 25-40 | 25-35                  | 5-15                     |
|                             | 4-11  | Very gravelly<br>sandy clay loam,<br>extremely cobbly<br>clay loam, very<br>gravelly clay<br>loam. | GC                      | A-2              | 5-45                            | 40-50                                | 25-35 | 20-30 | 10-25 | 35-45                  | 15-25                    |
|                             | 11-15 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Punchbowl-----              | 0-3   | Gravelly loam----                                                                                  | SM                      | A-2, A-4         | 5-10                            | 65-85                                | 60-75 | 45-60 | 30-45 | 15-25                  | NP-5                     |
|                             | 3-7   | Loam, gravelly<br>loam.                                                                            | SC, GC, CL              | A-6              | 0-5                             | 70-100                               | 65-95 | 60-85 | 45-55 | 25-35                  | 10-15                    |
|                             | 7-11  | Gravelly clay<br>loam, gravelly<br>sandy clay loam.                                                | GC                      | A-6, A-7         | 0-5                             | 55-65                                | 50-60 | 45-55 | 35-45 | 35-45                  | 15-20                    |
|                             | 11    | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 3451*:<br>Reluctan-----     | 0-8   | Very cobbly loam                                                                                   | GM-GC                   | A-2, A-4         | 30-50                           | 55-65                                | 45-60 | 40-55 | 30-45 | 25-30                  | 5-10                     |
|                             | 8-33  | Gravelly loam,<br>gravelly clay<br>loam.                                                           | GC, CL                  | A-6, A-7         | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45                  | 15-20                    |
|                             | 33-37 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Robson-----                 | 0-10  | Very cobbly loam                                                                                   | GM-GC, GC,<br>SM-SC, SC | A-2              | 30-50                           | 55-75                                | 50-65 | 30-50 | 25-35 | 25-35                  | 5-15                     |
|                             | 10-14 | Very cobbly clay<br>loam.                                                                          | GC                      | A-7              | 30-45                           | 55-75                                | 50-60 | 40-60 | 35-50 | 40-45                  | 15-20                    |
|                             | 14-19 | Very cobbly clay,<br>extremely cobbly<br>clay.                                                     | GC, GM                  | A-7              | 50-80                           | 60-70                                | 50-65 | 40-55 | 35-50 | 45-55                  | 20-25                    |
|                             | 19    | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| Sumine-----                 | 0-10  | Very cobbly loam                                                                                   | GM-GC                   | A-2, A-4         | 30-55                           | 55-65                                | 50-60 | 40-55 | 30-45 | 20-30                  | 5-10                     |
|                             | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.                    | GC                      | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45                  | 15-25                    |
|                             | 30-34 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |
| 3452*:<br>Reluctan-----     | 0-8   | Cobbly loam-----                                                                                   | SM-SC,<br>CL-ML         | A-4              | 15-30                           | 80-90                                | 70-90 | 60-85 | 40-70 | 20-30                  | 5-10                     |
|                             | 8-33  | Gravelly loam,<br>gravelly clay<br>loam.                                                           | GC, CL                  | A-6, A-7         | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45                  | 15-20                    |
|                             | 33-37 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---                    | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                    | Classification  |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|---------------------------------------------------------------------------------|-----------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                                 | Unified         | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                          | In    |                                                                                 |                 |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 3452*:<br>Sumine-----    | 0-10  | Very cobbly loam                                                                | GM-GC           | A-2, A-4         | 30-55                           | 55-65                                | 50-60 | 40-55 | 30-45 | 20-30           | 5-10                     |
|                          | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam. | GC              | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45           | 15-25                    |
|                          | 30-34 | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Colbar-----              | 0-3   | Very cobbly loam                                                                | CL-ML           | A-4              | 50-60                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30           | 5-10                     |
|                          | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                     | CL              | A-6              | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                          | 22-26 | Gravelly loam,<br>cobbly loam.                                                  | SM-SC,<br>CL-ML | A-4              | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                          | 26-30 | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3453*:<br>Reluctan-----  | 0-8   | Very gravelly<br>loam.                                                          | GM-GC           | A-2, A-4         | 10-25                           | 35-65                                | 30-55 | 25-55 | 20-40 | 25-30           | 5-10                     |
|                          | 8-33  | Gravelly clay<br>loam, gravelly<br>loam.                                        | GC, CL          | A-6, A-7         | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45           | 15-20                    |
|                          | 33-37 | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Locane-----              | 0-6   | Extremely<br>gravelly sandy<br>loam.                                            | GM-GC,<br>GP-GC | A-2              | 5-20                            | 40-55                                | 15-25 | 10-20 | 5-15  | 20-30           | 5-10                     |
|                          | 6-14  | Very gravelly<br>clay loam.                                                     | GC              | A-2, A-7,<br>A-6 | 0-10                            | 50-65                                | 35-50 | 30-45 | 25-40 | 35-45           | 15-20                    |
|                          | 14    | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Itca-----                | 0-9   | Very cobbly loam                                                                | GM-GC, GC       | A-4, A-6         | 30-50                           | 60-75                                | 50-65 | 45-60 | 35-50 | 25-35           | 5-15                     |
|                          | 9-17  | Very cobbly clay<br>loam, very<br>gravelly clay,<br>extremely<br>gravelly clay. | CL, GC          | A-7, A-2         | 0-55                            | 40-80                                | 30-75 | 25-70 | 20-60 | 40-50           | 15-25                    |
|                          | 17-21 | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3455*:<br>Reluctan-----  | 0-8   | Very cobbly loam                                                                | GM-GC           | A-2, A-4         | 30-50                           | 55-65                                | 45-60 | 40-55 | 30-45 | 25-30           | 5-10                     |
|                          | 8-33  | Gravelly loam,<br>gravelly clay<br>loam.                                        | GC, CL          | A-6, A-7         | 0-15                            | 65-85                                | 60-75 | 55-75 | 40-60 | 35-45           | 15-20                    |
|                          | 33-37 | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Roca-----                | 0-5   | Very cobbly loam                                                                | CL              | A-6              | 50-60                           | 85-100                               | 75-85 | 70-80 | 50-60 | 25-35           | 10-15                    |
|                          | 5-27  | Very gravelly<br>clay loam, very<br>gravelly clay.                              | GC, SC          | A-2              | 0-10                            | 60-75                                | 30-50 | 25-45 | 20-35 | 45-60           | 20-30                    |
|                          | 27-31 | Unweathered<br>bedrock.                                                         | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                                       | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|----------------------------------------------------------------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                                                    | Unified                 | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                          | In    |                                                                                                    |                         |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 3455*:<br>Colbar-----    | 0-3   | Cobbly loam-----                                                                                   | CL-ML                   | A-4              | 35-45                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30           | 5-10                     |
|                          | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                                        | CL                      | A-6              | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                          | 22-26 | Gravelly loam,<br>cobbly loam.                                                                     | SM-SC,<br>CL-ML         | A-4              | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                          | 26-30 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3560*:<br>Locane-----    | 0-6   | Very gravelly<br>loam.                                                                             | GM-GC                   | A-2              | 5-15                            | 50-65                                | 30-45 | 25-40 | 15-30 | 20-30           | 5-10                     |
|                          | 6-14  | Very gravelly<br>clay loam.                                                                        | GC                      | A-2, A-7,<br>A-6 | 0-10                            | 50-65                                | 35-50 | 30-45 | 25-40 | 35-45           | 15-20                    |
|                          | 14    | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Robson-----              | 0-7   | Gravelly loam----                                                                                  | SM-SC, SC,<br>CL-ML, CL | A-4, A-6         | 5-15                            | 70-85                                | 60-75 | 50-65 | 40-55 | 25-35           | 5-15                     |
|                          | 7-19  | Very cobbly clay,<br>extremely cobbly<br>clay.                                                     | GC, GM                  | A-7              | 50-80                           | 60-70                                | 50-65 | 40-55 | 35-50 | 45-55           | 20-25                    |
|                          | 19    | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Bregar-----              | 0-4   | Extremely<br>gravelly loam.                                                                        | GM-GC, GC               | A-2              | 10-20                           | 35-50                                | 20-30 | 15-25 | 10-20 | 25-35           | 5-15                     |
|                          | 4-11  | Very gravelly<br>sandy clay loam,<br>extremely cobbly<br>clay loam, very<br>gravelly clay<br>loam. | GC                      | A-2              | 5-45                            | 40-50                                | 25-35 | 20-30 | 10-25 | 35-45           | 15-25                    |
|                          | 11-15 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3561*:<br>Locane-----    | 0-6   | Very gravelly<br>loam.                                                                             | GM-GC                   | A-2              | 5-15                            | 50-65                                | 30-45 | 25-40 | 15-30 | 20-30           | 5-10                     |
|                          | 6-14  | Very gravelly<br>clay loam.                                                                        | GC                      | A-2, A-7,<br>A-6 | 0-10                            | 50-65                                | 35-50 | 30-45 | 25-40 | 35-45           | 15-20                    |
|                          | 14    | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Sumine-----              | 0-10  | Gravelly loam----                                                                                  | GM, SM                  | A-2, A-4         | 0                               | 55-80                                | 50-75 | 35-70 | 25-50 | 20-25           | NP-5                     |
|                          | 10-30 | Very gravelly<br>clay loam, very<br>cobbly clay<br>loam, very<br>gravelly loam.                    | GC                      | A-2, A-6,<br>A-7 | 15-40                           | 45-70                                | 35-65 | 30-50 | 25-45 | 35-45           | 15-25                    |
|                          | 30-34 | Unweathered<br>bedrock.                                                                            | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                       | Classification |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|----------------------------------------------------|----------------|---------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                          |       |                                                    | Unified        | AASHTO        |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                          | In    |                                                    |                |               | Pct                             |                                      |       |       |       | Pct             |                          |
| 3561*:<br>Glean-----     | 0-6   | Gravelly silt loam.                                | GM, SM, ML     | A-4           | 0-10                            | 55-80                                | 50-75 | 45-65 | 40-55 | 20-30           | NP-5                     |
|                          | 6-49  | Very gravelly sandy loam, very gravelly loam.      | GM             | A-1, A-2      | 0-25                            | 30-65                                | 25-60 | 20-50 | 10-35 | 20-30           | NP-5                     |
|                          | 49-53 | Unweathered bedrock.                               | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3564*:<br>Locane-----    | 0-6   | Very gravelly fine sandy loam.                     | GM-GC          | A-2           | 5-15                            | 50-65                                | 30-45 | 25-40 | 15-30 | 20-30           | 5-10                     |
|                          | 6-14  | Very gravelly clay loam.                           | GC             | A-2, A-7, A-6 | 0-10                            | 50-65                                | 35-50 | 30-45 | 25-40 | 35-45           | 15-20                    |
|                          | 14    | Unweathered bedrock.                               | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Zoesta-----              | 0-7   | Cobbly loam-----                                   | CL-ML, ML      | A-4           | 25-40                           | 80-90                                | 75-90 | 65-80 | 50-65 | 20-30           | NP-10                    |
|                          | 7-23  | Clay-----                                          | CL, CH         | A-7           | 0-10                            | 90-100                               | 85-95 | 75-90 | 65-80 | 45-60           | 20-30                    |
|                          | 23-31 | Gravelly clay loam, gravelly clay.                 | GC, CL         | A-6, A-7      | 0                               | 60-75                                | 55-70 | 50-65 | 40-55 | 35-50           | 15-25                    |
|                          | 31-60 | Very gravelly clay loam, very gravelly loam.       | GC             | A-2           | 0                               | 45-55                                | 30-45 | 25-40 | 20-35 | 30-40           | 10-15                    |
| Bucan-----               | 0-5   | Cobbly loam-----                                   | CL             | A-6           | 20-25                           | 75-85                                | 70-80 | 65-75 | 50-60 | 30-35           | 10-15                    |
|                          | 5-30  | Clay-----                                          | CH             | A-7           | 0-10                            | 85-95                                | 80-90 | 75-85 | 65-75 | 50-60           | 35-45                    |
|                          | 30-52 | Cobbly clay, gravelly clay loam, gravelly clay.    | CL             | A-7           | 10-30                           | 75-90                                | 70-85 | 60-70 | 50-60 | 40-50           | 25-35                    |
|                          | 52-56 | Unweathered bedrock.                               | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3621*:<br>Minat-----     | 0-9   | Very cobbly sandy loam.                            | SM-SC          | A-2           | 30-45                           | 60-75                                | 50-65 | 40-55 | 20-35 | 20-30           | 5-10                     |
|                          | 9-27  | Very gravelly loam.                                | GC, GM-GC      | A-2           | 0-10                            | 45-60                                | 30-50 | 25-45 | 20-35 | 25-35           | 5-15                     |
|                          | 27-60 | Very gravelly loam, very gravelly fine sandy loam. | GM-GC, GC      | A-2           | 0-10                            | 45-60                                | 30-50 | 20-45 | 15-30 | 25-35           | 5-15                     |
| Bojo-----                | 0-4   | Extremely gravelly loam.                           | GM-GC          | A-2           | 10-25                           | 40-55                                | 20-35 | 15-30 | 10-25 | 20-25           | 5-10                     |
|                          | 4-10  | Gravelly clay loam, gravelly loam, clay loam.      | GC, CL         | A-6, A-7      | 0-10                            | 70-90                                | 65-85 | 60-80 | 45-70 | 35-45           | 15-20                    |
|                          | 10-14 | Unweathered bedrock.                               | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Stingdorn-----           | 0-7   | Very gravelly loam.                                | GM, GM-GC      | A-1, A-2      | 5-10                            | 45-60                                | 35-50 | 30-45 | 20-35 | 15-25           | NP-10                    |
|                          | 7-15  | Very cobbly clay loam.                             | GC             | A-6           | 30-50                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-40           | 15-20                    |
|                          | 15-20 | Indurated-----                                     | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                          | 20    | Unweathered bedrock.                               | ---            | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                 | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|------------------------------------------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                              | Unified                 | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                              |                         |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 3622*:<br>Minat-----        | 0-9   | Very cobbly loam                                                             | GM-GC, GC,<br>SM-SC, SC | A-2, A-4,<br>A-6 | 30-45                           | 60-75                                | 50-65 | 40-55 | 30-45 | 25-35           | 5-15                     |
|                             | 9-27  | Very gravelly<br>loam.                                                       | GC, GM-GC               | A-2              | 0-10                            | 45-60                                | 30-50 | 25-45 | 20-35 | 25-35           | 5-15                     |
|                             | 27-60 | Very gravelly<br>loam, very<br>gravelly fine<br>sandy loam.                  | GM-GC, GC               | A-2              | 0-10                            | 45-60                                | 30-50 | 20-45 | 15-30 | 25-35           | 5-15                     |
| Minat, eroded---            | 0-4   | Very cobbly loam                                                             | GM-GC, GC,<br>SM-SC, SC | A-2, A-4,<br>A-6 | 30-45                           | 60-75                                | 50-65 | 40-55 | 30-45 | 25-35           | 5-15                     |
|                             | 4-21  | Very gravelly<br>loam.                                                       | GC, GM-GC               | A-2              | 0-10                            | 45-60                                | 30-50 | 25-45 | 20-35 | 25-35           | 5-15                     |
|                             | 21-60 | Very gravelly<br>loam, very<br>gravelly fine<br>sandy loam.                  | GM-GC, GC               | A-2              | 0-10                            | 45-60                                | 30-50 | 20-45 | 15-30 | 25-35           | 5-15                     |
| 3624*:<br>Minat-----        | 0-9   | Very cobbly loam                                                             | GM-GC, GC,<br>SM-SC, SC | A-2, A-4,<br>A-6 | 30-45                           | 60-75                                | 50-65 | 40-55 | 30-45 | 25-35           | 5-15                     |
|                             | 9-27  | Very gravelly<br>loam.                                                       | GC, GM-GC               | A-2              | 0-10                            | 45-60                                | 30-50 | 25-45 | 20-35 | 25-35           | 5-15                     |
|                             | 27-60 | Very gravelly<br>loam, very<br>gravelly fine<br>sandy loam.                  | GM-GC, GC               | A-2              | 0-10                            | 45-60                                | 30-50 | 20-45 | 15-30 | 25-35           | 5-15                     |
| Colbar-----                 | 0-3   | Cobbly loam-----                                                             | CL-ML                   | A-4              | 35-45                           | 90-100                               | 85-95 | 75-85 | 50-60 | 20-30           | 5-10                     |
|                             | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                  | CL                      | A-6              | 10-35                           | 90-95                                | 70-85 | 60-80 | 50-65 | 30-40           | 10-20                    |
|                             | 22-26 | Gravelly loam,<br>cobbly loam.                                               | SM-SC,<br>CL-ML         | A-4              | 5-30                            | 75-95                                | 60-90 | 55-75 | 35-55 | 20-30           | 5-10                     |
|                             | 26-30 | Unweathered<br>bedrock.                                                      | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Atlow-----                  | 0-3   | Very cobbly loam                                                             | SM-SC                   | A-4              | 35-50                           | 70-80                                | 60-75 | 50-65 | 35-50 | 20-30           | 5-10                     |
|                             | 3-14  | Very gravelly<br>clay loam.                                                  | GC                      | A-2, A-6         | 5-15                            | 45-60                                | 35-50 | 30-45 | 25-40 | 30-40           | 10-15                    |
|                             | 14    | Unweathered<br>bedrock.                                                      | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3650*:<br>McVegas-----      | 0-5   | Very cobbly loam                                                             | SM                      | A-4              | 35-45                           | 70-85                                | 55-70 | 50-65 | 35-50 | 15-25           | NP-5                     |
|                             | 5-19  | Very cobbly silty<br>clay, very<br>cobbly clay,<br>very cobbly clay<br>loam. | CL, CH, GC              | A-7              | 30-40                           | 70-85                                | 65-75 | 50-70 | 45-70 | 40-55           | 20-30                    |
|                             | 19-22 | Cemented-----                                                                | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 22    | Unweathered<br>bedrock.                                                      | ---                     | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                  | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                               | Unified        | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                          | In    |                                                                               |                |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 3650*:<br>Old Camp-----  | 0-2   | Very gravelly loam.                                                           | GM, GM-GC      | A-1, A-2 | 0-15                            | 50-60                                | 35-45  | 30-40 | 20-30 | 15-25           | NP-10                    |
|                          | 2-14  | Very cobbly clay loam, extremely stony sandy clay loam, very stony clay loam. | GC             | A-2, A-6 | 35-50                           | 40-55                                | 35-50  | 30-45 | 25-40 | 30-40           | 15-25                    |
|                          | 14    | Unweathered bedrock.                                                          | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Kingingham-----          | 0-7   | Gravelly very fine sandy loam.                                                | SM             | A-2, A-4 | 0-5                             | 70-85                                | 55-70  | 50-65 | 30-50 | 15-25           | NP-5                     |
|                          | 7-22  | Gravelly clay loam, gravelly clay, gravelly silty clay loam.                  | GC, CL, CH     | A-7      | 0-5                             | 70-85                                | 55-70  | 50-65 | 45-60 | 40-55           | 20-30                    |
|                          | 22-60 | Indurated-----                                                                | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 3651*:<br>McVegas-----   | 0-5   | Cobbly loam-----                                                              | ML, SM, GM     | A-4      | 20-30                           | 70-90                                | 70-80  | 55-70 | 45-65 | 20-30           | NP-5                     |
|                          | 5-19  | Very cobbly silty clay, very cobbly clay, very cobbly clay loam.              | CL, CH, GC     | A-7      | 30-40                           | 70-85                                | 65-75  | 50-70 | 45-70 | 40-55           | 20-30                    |
|                          | 19-22 | Cemented-----                                                                 | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                          | 22    | Unweathered bedrock.                                                          | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Beoska-----              | 0-8   | Gravelly loam-----                                                            | SM, SM-SC      | A-4      | 0-10                            | 70-80                                | 55-75  | 40-65 | 35-50 | 20-30           | NP-10                    |
|                          | 8-18  | Silt loam, silty clay loam.                                                   | CL             | A-6, A-7 | 0                               | 80-100                               | 75-100 | 70-85 | 60-85 | 35-45           | 15-25                    |
|                          | 18-60 | Stratified gravelly very fine sandy loam to gravelly sandy loam.              | GM, SM         | A-1, A-2 | 0-10                            | 60-80                                | 55-70  | 30-50 | 20-35 | ---             | NP                       |
| 3652*:<br>McVegas-----   | 0-5   | Very cobbly loam                                                              | SM             | A-4      | 35-45                           | 70-85                                | 55-70  | 50-65 | 35-50 | 15-25           | NP-5                     |
|                          | 5-19  | Very cobbly silty clay, very cobbly clay, very cobbly clay loam.              | CL, CH, GC     | A-7      | 30-40                           | 70-85                                | 65-75  | 50-70 | 45-70 | 40-55           | 20-30                    |
|                          | 19-22 | Cemented-----                                                                 | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                          | 22    | Unweathered bedrock.                                                          | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Stingdorn-----           | 0-7   | Extremely cobbly fine sandy loam.                                             | GM, GM-GC      | A-1, A-2 | 50-60                           | 45-60                                | 35-50  | 30-45 | 15-30 | 15-25           | NP-10                    |
|                          | 7-15  | Very cobbly clay loam.                                                        | GC             | A-6      | 30-50                           | 60-75                                | 50-65  | 45-60 | 35-50 | 35-40           | 15-20                    |
|                          | 15-20 | Indurated-----                                                                | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
|                          | 20    | Unweathered bedrock.                                                          | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                                    | Classification             |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit<br>Pct | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------------|----------------------------|----------|---------------------------------|--------------------------------------|--------|--------|-------|------------------------|--------------------------|
|                             |       |                                                                                                 | Unified                    | AASHTO   |                                 | 4                                    | 10     | 40     | 200   |                        |                          |
|                             | In    |                                                                                                 |                            |          | Pct                             |                                      |        |        |       |                        |                          |
| 3652*:<br>Colbar-----       | 0-3   | Very cobbly loam                                                                                | CL-ML                      | A-4      | 50-60                           | 90-100                               | 85-95  | 75-85  | 50-60 | 20-30                  | 5-10                     |
|                             | 3-22  | Cobbly loam,<br>gravelly clay<br>loam, cobbly<br>clay loam.                                     | CL                         | A-6      | 10-35                           | 90-95                                | 70-85  | 60-80  | 50-65 | 30-40                  | 10-20                    |
|                             | 22-26 | Gravelly loam,<br>cobbly loam.                                                                  | SM-SC,<br>CL-ML            | A-4      | 5-30                            | 75-95                                | 60-90  | 55-75  | 35-55 | 20-30                  | 5-10                     |
|                             | 26-30 | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| 3661*:<br>Dun Glen-----     | 0-3   | Very fine sandy<br>loam.                                                                        | ML                         | A-4      | 0                               | 95-100                               | 90-100 | 80-95  | 50-65 | 15-25                  | NP-5                     |
|                             | 3-10  | Silt loam, very<br>fine sandy loam.                                                             | ML                         | A-4      | 0                               | 95-100                               | 90-100 | 85-100 | 55-70 | 15-25                  | NP-5                     |
|                             | 10-60 | Fine sandy loam,<br>very fine sandy<br>loam.                                                    | SM                         | A-4      | 0                               | 90-100                               | 85-100 | 70-85  | 35-50 | 15-25                  | NP-5                     |
| Whirlo-----                 | 0-12  | Fine sandy loam                                                                                 | ML, SM                     | A-4      | 0                               | 80-95                                | 75-85  | 65-80  | 45-60 | 20-25                  | NP-5                     |
|                             | 12-24 | Very gravelly<br>fine sandy loam,<br>very gravelly<br>loam.                                     | GM                         | A-1, A-2 | 0-5                             | 45-55                                | 35-50  | 30-40  | 15-35 | ---                    | NP                       |
|                             | 24-60 | Stratified very<br>gravelly loam to<br>extremely coarse<br>gravelly coarse<br>sandy loam.       | GW-GM,<br>GP-GM            | A-1      | 0-5                             | 40-50                                | 20-35  | 10-25  | 5-10  | ---                    | NP                       |
| 3690*:<br>Izod-----         | 0-4   | Cobbly loam-----                                                                                | SM-SC, SM,<br>CL-ML, ML    | A-4      | 15-30                           | 80-95                                | 70-90  | 55-75  | 45-65 | 25-35                  | 5-10                     |
|                             | 4-10  | Very gravelly<br>loam, extremely<br>gravelly loam.                                              | GM-GC, GM                  | A-2      | 0-25                            | 20-55                                | 15-50  | 15-45  | 10-35 | 25-35                  | 5-10                     |
|                             | 10-14 | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Koynik-----                 | 0-6   | Very gravelly<br>very fine sandy<br>loam.                                                       | GM-GC,<br>SM-SC,<br>GM, SM | A-2, A-1 | 0-5                             | 55-70                                | 35-50  | 30-45  | 15-30 | 20-30                  | NP-10                    |
|                             | 6-8   | Very gravelly<br>loam, very<br>gravelly very<br>fine sandy loam,<br>very gravelly<br>silt loam. | GM-GC,<br>SM-SC,<br>GC, SC | A-2      | 0-5                             | 55-70                                | 35-50  | 30-45  | 15-30 | 25-35                  | 5-15                     |
|                             | 8     | Unweathered<br>bedrock.                                                                         | ---                        | ---      | ---                             | ---                                  | ---    | ---    | ---   | ---                    | ---                      |
| Rock outcrop.               |       |                                                                                                 |                            |          |                                 |                                      |        |        |       |                        |                          |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                 | Classification          |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|----------------------------------------------|-------------------------|------------------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                          |       |                                              | Unified                 | AASHTO           |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                          | In    |                                              |                         |                  | Pct                             |                                      |        |        |       | Pct             |                          |
| 3691*:<br>Izod-----      | 0-4   | Extremely cobbly loam.                       | SM-SC, SM,<br>GM-GC, GM | A-2              | 40-50                           | 55-70                                | 25-40  | 20-40  | 15-35 | 25-35           | 5-10                     |
|                          | 4-10  | Very gravelly loam, extremely gravelly loam. | GM-GC, GM               | A-2              | 0-25                            | 20-55                                | 15-50  | 15-45  | 10-35 | 25-35           | 5-10                     |
|                          | 10-14 | Unweathered bedrock.                         | ---                     | ---              | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Rock outcrop.            |       |                                              |                         |                  |                                 |                                      |        |        |       |                 |                          |
| 3693*:<br>Izod-----      | 0-4   | Cobbly loam-----                             | SM-SC, SM,<br>CL-ML, ML | A-4              | 15-30                           | 80-95                                | 70-90  | 55-75  | 45-65 | 25-35           | 5-10                     |
|                          | 4-10  | Very gravelly loam, extremely gravelly loam. | GM-GC, GM               | A-2              | 0-25                            | 20-55                                | 15-50  | 15-45  | 10-35 | 25-35           | 5-10                     |
|                          | 10    | Unweathered bedrock.                         | ---                     | ---              | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Attella-----             | 0-3   | Very gravelly loam.                          | GM                      | A-1, A-2         | 5-15                            | 35-55                                | 30-50  | 25-40  | 20-35 | 25-35           | NP-10                    |
|                          | 3-7   | Very gravelly loam, very gravelly silt loam. | GC, GM-GC               | A-2              | 5-15                            | 35-55                                | 30-50  | 25-40  | 20-35 | 25-40           | 5-15                     |
|                          | 7     | Unweathered bedrock.                         | ---                     | ---              | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Xine-----                | 0-10  | Gravelly loam----                            | SM                      | A-2, A-4         | 0-5                             | 65-80                                | 50-75  | 45-60  | 30-45 | 15-25           | NP-5                     |
|                          | 10-33 | Very cobbly loam, very cobbly sandy loam.    | GM, SM                  | A-2, A-4,<br>A-1 | 35-50                           | 55-80                                | 50-75  | 35-60  | 20-45 | 15-25           | NP-5                     |
|                          | 33    | Weathered bedrock                            | ---                     | ---              | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| 3740-----<br>Kelk        | 0-3   | Silt loam-----                               | CL-ML, ML               | A-4              | 0                               | 100                                  | 100    | 95-100 | 85-95 | 25-35           | 5-10                     |
|                          | 3-18  | Silt loam-----                               | CL-ML, ML               | A-4              | 0                               | 95-100                               | 95-100 | 95-100 | 85-95 | 25-35           | 5-10                     |
|                          | 18-42 | Silt loam-----                               | CL-ML, ML               | A-4              | 0                               | 95-100                               | 95-100 | 95-100 | 85-95 | 25-35           | 5-10                     |
|                          | 42-60 | Silt loam-----                               | CL-ML, ML               | A-4              | 0                               | 95-100                               | 95-100 | 95-100 | 85-95 | 25-35           | 5-10                     |
| 3741*:<br>Kelk-----      | 0-14  | Very fine sandy loam.                        | CL-ML                   | A-4              | 0                               | 100                                  | 100    | 90-95  | 65-75 | 25-30           | 5-10                     |
|                          | 14-51 | Silt loam-----                               | CL-ML, CL               | A-4, A-6         | 0                               | 95-100                               | 95-100 | 95-100 | 85-95 | 25-35           | 5-15                     |
|                          | 51-60 | Silt loam-----                               | CL-ML, CL               | A-4, A-6         | 0                               | 95-100                               | 90-100 | 90-100 | 80-95 | 25-35           | 5-15                     |
| Settle Meyer-----        | 0-16  | Fine sandy loam                              | SM, SM-SC               | A-4              | 0                               | 100                                  | 100    | 75-90  | 35-50 | 20-30           | NP-10                    |
|                          | 16-40 | Silt loam, silty clay loam.                  | CL                      | A-6, A-7         | 0                               | 95-100                               | 90-100 | 85-90  | 60-85 | 35-45           | 15-20                    |
|                          | 40-60 | Fine sandy loam                              | CL-ML,<br>SM-SC         | A-4              | 0                               | 95-100                               | 90-100 | 80-90  | 40-60 | 20-30           | 5-10                     |
| 3742*:<br>Kelk-----      | 0-14  | Very fine sandy loam.                        | CL-ML                   | A-4              | 0                               | 100                                  | 100    | 90-95  | 65-75 | 25-30           | 5-10                     |
|                          | 14-51 | Silt loam-----                               | CL-ML, CL               | A-4, A-6         | 0                               | 95-100                               | 95-100 | 95-100 | 85-95 | 25-35           | 5-15                     |
|                          | 51-60 | Silt loam-----                               | CL-ML, CL               | A-4, A-6         | 0                               | 95-100                               | 90-100 | 90-100 | 80-95 | 25-35           | 5-15                     |
| Ocala-----               | 0-13  | Silt loam-----                               | ML, CL                  | A-4, A-6         | 0                               | 100                                  | 100    | 95-100 | 85-95 | 30-40           | 5-15                     |
|                          | 13-60 | Silt loam, silty clay loam.                  | ML, CL                  | A-6, A-7         | 0                               | 90-100                               | 90-100 | 90-95  | 85-90 | 30-50           | 10-20                    |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                    | Classification          |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|---------------------------------------------------------------------------------|-------------------------|----------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                 | Unified                 | AASHTO   |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                 |                         |          | Pct                             |                                      |       |       |       | Pct             |                          |
| 3840*:<br>Jung-----         | 0-8   | Very gravelly<br>loam.                                                          | GM                      | A-1, A-2 | 0-10                            | 50-60                                | 35-50 | 25-45 | 20-35 | 20-25           | NP-5                     |
|                             | 8-19  | Very cobbly clay<br>loam, very<br>cobbly clay,<br>very gravelly<br>clay loam.   | GC                      | A-7      | 15-40                           | 55-65                                | 50-60 | 40-50 | 35-45 | 40-55           | 20-30                    |
|                             | 19    | Unweathered<br>bedrock.                                                         | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Norfork-----                | 0-3   | Gravelly loam----                                                               | GM-GC, GC               | A-4, A-6 | 0-5                             | 60-75                                | 55-70 | 45-60 | 35-50 | 25-35           | 5-15                     |
|                             | 3-14  | Gravelly silty<br>clay, gravelly<br>silty clay loam.                            | GM, ML, MH              | A-7      | 0                               | 60-75                                | 55-70 | 50-65 | 45-60 | 45-60           | 15-20                    |
|                             | 14-17 | Gravelly loam----                                                               | GM-GC, GC,<br>SM-SC, SC | A-4, A-6 | 0                               | 55-80                                | 50-75 | 40-60 | 35-50 | 25-35           | 5-15                     |
|                             | 17-22 | Indurated-----                                                                  | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Buffaran-----               | 22    | Unweathered<br>bedrock.                                                         | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 0-4   | Gravelly loam----                                                               | SC, CL                  | A-6      | 5-15                            | 75-90                                | 70-80 | 50-75 | 40-60 | 25-35           | 10-15                    |
|                             | 4-15  | Gravelly clay<br>loam, gravelly<br>clay, clay.                                  | CL, CH                  | A-7      | 0-5                             | 75-90                                | 70-85 | 65-80 | 50-65 | 40-55           | 20-30                    |
| 3841*:<br>Jung-----         | 15-60 | Indurated-----                                                                  | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                             | 0-8   | Very cobbly loam                                                                | GM-GC,<br>SM-SC         | A-4      | 35-50                           | 65-80                                | 50-65 | 45-60 | 35-50 | 25-30           | 5-10                     |
|                             | 8-19  | Very cobbly clay<br>loam, very<br>cobbly clay,<br>very gravelly<br>clay loam.   | GC                      | A-7      | 15-40                           | 55-65                                | 50-60 | 40-50 | 35-45 | 40-55           | 20-30                    |
|                             | 19    | Unweathered<br>bedrock.                                                         | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Itca-----                   | 0-9   | Very cobbly loam                                                                | GM-GC, GC               | A-4, A-6 | 30-50                           | 60-75                                | 50-65 | 45-60 | 35-50 | 25-35           | 5-15                     |
|                             | 9-17  | Very cobbly clay<br>loam, very<br>gravelly clay,<br>extremely<br>gravelly clay. | CL, GC                  | A-7, A-2 | 0-55                            | 40-80                                | 30-75 | 25-70 | 20-60 | 40-50           | 15-25                    |
|                             | 17-21 | Unweathered<br>bedrock.                                                         | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Roca-----                   | 0-5   | Very cobbly loam                                                                | CL                      | A-6      | 50-60                           | 85-100                               | 75-85 | 70-80 | 50-60 | 25-35           | 10-15                    |
|                             | 5-27  | Very gravelly<br>clay loam, very<br>gravelly clay.                              | GC, SC                  | A-2      | 0-10                            | 60-75                                | 30-50 | 25-45 | 20-35 | 45-60           | 20-30                    |
|                             | 27-31 | Unweathered<br>bedrock.                                                         | ---                     | ---      | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol   | Depth | USDA texture                                                      | Classification       |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|----------------------------|-------|-------------------------------------------------------------------|----------------------|---------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                            |       |                                                                   | Unified              | AASHTO        |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                            | In    |                                                                   |                      |               | Pct                             |                                      |       |       |       | Pct             |                          |
| 3843*:<br>Jung, steep----- | 0-8   | Very gravelly loam.                                               | GM                   | A-1, A-2      | 0-10                            | 50-60                                | 35-50 | 25-45 | 20-35 | 20-25           | NP-5                     |
|                            | 8-19  | Very cobbly clay loam, very cobbly clay, very gravelly clay loam. | GC                   | A-7           | 15-40                           | 55-65                                | 50-60 | 40-50 | 35-45 | 40-55           | 20-30                    |
|                            | 19    | Unweathered bedrock.                                              | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Robson-----                | 0-7   | Cobbly loam-----                                                  | SM-SC, SC, CL-ML, CL | A-4, A-6      | 15-45                           | 90-95                                | 65-95 | 55-65 | 45-60 | 25-35           | 5-15                     |
|                            | 7-19  | Very cobbly clay, extremely cobbly clay.                          | GC                   | A-7           | 50-80                           | 60-70                                | 50-65 | 40-55 | 35-50 | 45-55           | 20-30                    |
|                            | 19    | Unweathered bedrock.                                              | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Jung-----                  | 0-8   | Very gravelly loam.                                               | GM                   | A-1, A-2      | 0-10                            | 50-60                                | 35-50 | 25-45 | 20-35 | 20-25           | NP-5                     |
|                            | 8-19  | Very cobbly clay loam, very cobbly clay, very gravelly clay loam. | GC                   | A-7           | 15-40                           | 55-65                                | 50-60 | 40-50 | 35-45 | 40-55           | 20-30                    |
|                            | 19    | Unweathered bedrock.                                              | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3845*:<br>Jung-----        | 0-8   | Very gravelly loam.                                               | GM                   | A-1, A-2      | 0-10                            | 50-60                                | 35-50 | 25-45 | 20-35 | 20-25           | NP-5                     |
|                            | 8-19  | Very cobbly clay loam, very cobbly clay, very gravelly clay loam. | GC                   | A-7           | 15-40                           | 55-65                                | 50-60 | 40-50 | 35-45 | 40-55           | 20-30                    |
|                            | 19    | Unweathered bedrock.                                              | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Stingdorn-----             | 0-7   | Extremely cobbly loam.                                            | GM, GM-GC            | A-1, A-2      | 50-60                           | 45-60                                | 35-50 | 30-45 | 15-30 | 15-25           | NP-10                    |
|                            | 7-15  | Very cobbly clay loam.                                            | GC                   | A-6           | 30-50                           | 60-75                                | 50-65 | 45-60 | 35-50 | 35-40           | 15-20                    |
|                            | 15-20 | Indurated-----                                                    | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
|                            | 20    | Unweathered bedrock.                                              | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Atlow-----                 | 0-3   | Very gravelly loam.                                               | GC, SC               | A-2, A-6      | 0-15                            | 35-85                                | 30-50 | 20-45 | 15-40 | 25-35           | 10-15                    |
|                            | 3-14  | Very gravelly clay loam, very cobbly clay loam.                   | GC                   | A-2, A-6, A-7 | 0-45                            | 35-60                                | 25-50 | 20-50 | 15-40 | 35-45           | 15-20                    |
|                            | 14-18 | Unweathered bedrock.                                              | ---                  | ---           | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol | Depth | USDA texture                                                                              | Classification  |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |       |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|-----------------------------|-------|-------------------------------------------------------------------------------------------|-----------------|------------------|---------------------------------|--------------------------------------|-------|-------|-------|-----------------|--------------------------|
|                             |       |                                                                                           | Unified         | AASHTO           |                                 | 4                                    | 10    | 40    | 200   |                 |                          |
|                             | In    |                                                                                           |                 |                  | Pct                             |                                      |       |       |       | Pct             |                          |
| 3846*:<br>Jung-----         | 0-8   | Very gravelly<br>loam.                                                                    | GM              | A-1, A-2         | 0-10                            | 50-60                                | 35-50 | 25-45 | 20-35 | 20-25           | NP-5                     |
|                             | 8-19  | Very cobbly clay<br>loam, very<br>cobbly clay,<br>very gravelly<br>clay loam.             | GC              | A-7              | 15-40                           | 55-65                                | 50-60 | 40-50 | 35-45 | 40-55           | 20-30                    |
|                             | 19    | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Wiskan-----                 | 0-16  | Very gravelly<br>silt loam.                                                               | GM, GM-GC       | A-1, A-2,<br>A-4 | 0-15                            | 40-60                                | 30-50 | 25-50 | 20-40 | 20-30           | NP-10                    |
|                             | 16-28 | Very gravelly<br>clay loam, very<br>gravelly loam,<br>extremely<br>gravelly clay<br>loam. | GC              | A-2              | 10-25                           | 40-55                                | 30-45 | 25-45 | 20-35 | 30-40           | 10-20                    |
|                             | 28    | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| 3881*:<br>Layview-----      | 0-3   | Extremely cobbly<br>loam.                                                                 | GM-GC           | A-4              | 50-65                           | 60-75                                | 55-65 | 45-60 | 35-50 | 25-30           | 5-10                     |
|                             | 3-12  | Very gravelly<br>loam, very<br>gravelly clay<br>loam.                                     | GC              | A-2, A-6         | 10-15                           | 45-55                                | 40-50 | 35-45 | 30-40 | 30-40           | 15-20                    |
|                             | 12    | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |
| Packer-----                 | 0-10  | Gravelly loam----                                                                         | SM-SC,<br>GM-GC | A-4              | 0-10                            | 65-80                                | 55-70 | 45-60 | 35-50 | 20-30           | 5-10                     |
|                             | 10-21 | Extremely cobbly<br>clay loam,<br>extremely cobbly<br>loam.                               | GC              | A-2              | 40-55                           | 40-55                                | 30-45 | 25-40 | 15-30 | 30-40           | 10-15                    |
|                             | 21-60 | Extremely cobbly<br>sandy loam,<br>extremely cobbly<br>loam.                              | GM              | A-1              | 40-55                           | 40-55                                | 30-45 | 20-35 | 10-25 | 20-25           | NP-5                     |
| Hapgood-----                | 0-17  | Gravelly loam----                                                                         | SM-SC           | A-4              | 5-10                            | 70-80                                | 60-75 | 55-70 | 35-50 | 25-30           | 5-10                     |
|                             | 17-40 | Very gravelly<br>loam.                                                                    | GC, GM-GC       | A-2              | 5-25                            | 50-60                                | 35-50 | 30-40 | 20-35 | 25-35           | 5-15                     |
|                             | 40-60 | Very cobbly loam,<br>very gravelly<br>loam.                                               | GC, GM-GC       | A-2              | 15-40                           | 55-65                                | 50-60 | 35-45 | 25-35 | 25-35           | 5-15                     |
| 3950*:<br>Hooplite-----     | 0-4   | Very gravelly<br>loam.                                                                    | GM-GC           | A-2              | 0-10                            | 45-60                                | 35-50 | 30-45 | 20-35 | 20-30           | 5-10                     |
|                             | 4-8   | Very gravelly<br>loam, very<br>gravelly clay<br>loam.                                     | GC              | A-2, A-6         | 0-15                            | 45-60                                | 35-50 | 30-45 | 25-40 | 30-40           | 10-15                    |
|                             | 8     | Unweathered<br>bedrock.                                                                   | ---             | ---              | ---                             | ---                                  | ---   | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                                                    | Classification       |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|---------------------------------------------------------------------------------|----------------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                          |       |                                                                                 | Unified              | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                          | In    |                                                                                 |                      |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 3950*:<br>Jung-----      | 0-8   | Very gravelly loam.                                                             | GM                   | A-1, A-2 | 0-10                            | 50-60                                | 35-50  | 25-45 | 20-35 | 20-25           | NP-5                     |
|                          | 8-19  | Very cobbly clay loam, very cobbly clay, very gravelly clay loam.               | GC                   | A-7      | 15-40                           | 55-65                                | 50-60  | 40-50 | 35-45 | 40-55           | 20-30                    |
|                          | 19    | Unweathered bedrock.                                                            | ---                  | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Izod-----                | 0-4   | Very cobbly loam                                                                | SM-SC, SM, GM-GC, GM | A-2, A-4 | 25-40                           | 60-80                                | 40-65  | 35-55 | 25-50 | 25-35           | 5-10                     |
|                          | 4-10  | Very gravelly loam, extremely gravelly loam.                                    | GM-GC, GM            | A-2      | 0-25                            | 20-55                                | 15-50  | 15-45 | 10-35 | 25-35           | 5-10                     |
|                          | 10    | Unweathered bedrock.                                                            | ---                  | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 3961*:<br>Pineval-----   | 0-5   | Very cobbly loam                                                                | SM-SC, GM-GC         | A-4      | 30-40                           | 65-80                                | 55-70  | 45-60 | 35-50 | 20-30           | 5-10                     |
|                          | 5-11  | Very gravelly clay loam, very gravelly loam, very gravelly sandy clay loam.     | GC                   | A-2      | 0-5                             | 35-60                                | 25-50  | 20-40 | 15-35 | 30-40           | 10-15                    |
|                          | 11-60 | Stratified very gravelly sandy loam to extremely gravelly sand.                 | GP-GM, GM            | A-1      | 0                               | 30-60                                | 20-50  | 15-40 | 5-20  | ---             | NP                       |
| Orovada-----             | 0-8   | Cobbly fine sandy loam.                                                         | SM                   | A-4      | 25-35                           | 85-95                                | 75-90  | 60-75 | 35-50 | 15-25           | NP-5                     |
|                          | 8-26  | Fine sandy loam, loam.                                                          | SM, ML               | A-4      | 0                               | 90-100                               | 80-95  | 60-80 | 40-60 | 20-30           | NP-5                     |
|                          | 26-60 | Stratified fine sandy loam to silt loam.                                        | SM, ML               | A-4      | 0                               | 90-100                               | 80-95  | 60-85 | 35-55 | 20-30           | NP-5                     |
| Beoska-----              | 0-13  | Very fine sandy loam.                                                           | ML, SM               | A-4      | 0                               | 85-95                                | 75-95  | 70-80 | 45-65 | 15-25           | NP-5                     |
|                          | 13-24 | Silt loam, silty clay loam.                                                     | CL                   | A-6, A-7 | 0                               | 80-100                               | 75-100 | 70-85 | 60-85 | 35-45           | 15-25                    |
|                          | 24-55 | Stratified gravelly very fine sandy loam to gravelly sandy loam.                | GM, SM               | A-1, A-2 | 0-10                            | 55-80                                | 50-75  | 30-50 | 20-35 | 15-25           | NP-5                     |
|                          | 55-60 | Stratified very gravelly sandy loam to extremely gravelly very fine sandy loam. | GM                   | A-1      | 0-15                            | 30-55                                | 25-50  | 15-35 | 10-25 | 15-25           | NP-5                     |
| 3990-----<br>Settlemyer  | 0-10  | Fine sandy loam                                                                 | SM, SM-SC            | A-4      | 0                               | 100                                  | 100    | 75-90 | 35-50 | 20-30           | NP-10                    |
|                          | 10-36 | Silt loam, silty clay loam.                                                     | CL                   | A-6, A-7 | 0                               | 95-100                               | 90-100 | 85-90 | 60-85 | 35-45           | 15-20                    |
|                          | 36-60 | Fine sandy loam                                                                 | CL-ML, SM-SC         | A-4      | 0                               | 95-100                               | 90-100 | 80-90 | 40-60 | 20-30           | 5-10                     |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and<br>map symbol            | Depth | USDA texture                                                                                    | Classification             |                  | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |        |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|----------------------------------------|-------|-------------------------------------------------------------------------------------------------|----------------------------|------------------|---------------------------------|--------------------------------------|--------|--------|-------|-----------------|--------------------------|
|                                        |       |                                                                                                 | Unified                    | AASHTO           |                                 | 4                                    | 10     | 40     | 200   |                 |                          |
|                                        | In    |                                                                                                 |                            |                  | Pct                             |                                      |        |        |       | Pct             |                          |
| 3992*:<br>Settlemeier,<br>drained----- | 0-16  | Loam-----                                                                                       | CL, CL-ML                  | A-4, A-6         | 0                               | 100                                  | 100    | 80-95  | 60-75 | 25-35           | 5-15                     |
|                                        | 16-40 | Silt loam, silty<br>clay loam.                                                                  | CL                         | A-6, A-7         | 0                               | 95-100                               | 90-100 | 85-90  | 60-85 | 35-45           | 15-20                    |
|                                        | 40-60 | Fine sandy loam                                                                                 | CL-ML,<br>SM-SC            | A-4              | 0                               | 95-100                               | 90-100 | 80-90  | 40-60 | 20-30           | 5-10                     |
| Settlemeier-----                       | 0-15  | Loam-----                                                                                       | CL                         | A-6              | 0                               | 90-100                               | 90-100 | 75-90  | 50-65 | 25-35           | 10-15                    |
|                                        | 15-35 | Silty clay loam,<br>clay loam.                                                                  | CL                         | A-6              | 0                               | 100                                  | 100    | 80-100 | 75-90 | 35-40           | 15-20                    |
|                                        | 35-60 | Stratified very<br>gravelly loamy<br>sand to silty<br>clay loam.                                | GC, CL,<br>GM-GC,<br>CL-ML | A-4, A-6         | 0-5                             | 60-90                                | 60-85  | 45-80  | 35-60 | 15-25           | 5-15                     |
| 4051*:<br>Attella-----                 | 0-4   | Very gravelly<br>loam.                                                                          | GM                         | A-1, A-2         | 5-15                            | 35-55                                | 30-50  | 25-40  | 20-35 | 25-35           | NP-10                    |
|                                        | 4-13  | Very gravelly<br>loam, very<br>gravelly silt<br>loam.                                           | GC, GM-GC                  | A-2              | 5-15                            | 35-55                                | 30-50  | 25-40  | 20-35 | 25-40           | 5-15                     |
|                                        | 13-17 | Unweathered<br>bedrock.                                                                         | ---                        | ---              | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Xine-----                              | 0-10  | Gravelly loam----                                                                               | SM                         | A-2, A-4         | 0-5                             | 65-80                                | 50-75  | 45-60  | 30-45 | 15-25           | NP-5                     |
|                                        | 10-33 | Very cobbly loam,<br>very cobbly<br>sandy loam.                                                 | GM, SM                     | A-2, A-4,<br>A-1 | 35-50                           | 55-80                                | 50-75  | 35-60  | 20-45 | 15-25           | NP-5                     |
|                                        | 33    | Weathered bedrock                                                                               | ---                        | ---              | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Kram-----                              | 0-3   | Very cobbly loam                                                                                | SM                         | A-4              | 35-45                           | 70-85                                | 55-70  | 50-65  | 35-50 | 15-25           | NP-5                     |
|                                        | 3-10  | Very gravelly<br>loam, very<br>gravelly very<br>fine sandy loam,<br>extremely<br>gravelly loam. | GM                         | A-1, A-2         | 0-15                            | 25-60                                | 15-55  | 15-45  | 10-30 | 15-25           | NP-5                     |
|                                        | 10    | Unweathered<br>bedrock.                                                                         | ---                        | ---              | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| 4070*:<br>Genaw-----                   | 0-6   | Gravelly loam----                                                                               | GM-GC,<br>SM-SC            | A-4              | 0-5                             | 65-80                                | 55-75  | 45-65  | 35-50 | 20-30           | 5-10                     |
|                                        | 6-11  | Gravelly loam,<br>gravelly clay<br>loam.                                                        | GC, SC                     | A-6              | 0-5                             | 60-80                                | 55-75  | 45-65  | 35-50 | 25-35           | 10-15                    |
|                                        | 11-16 | Very gravelly<br>loam.                                                                          | GM-GC                      | A-2              | 0-5                             | 45-55                                | 35-50  | 25-45  | 20-35 | 25-30           | 5-10                     |
|                                        | 16    | Weathered bedrock                                                                               | ---                        | ---              | ---                             | ---                                  | ---    | ---    | ---   | ---             | ---                      |
| Wieland-----                           | 0-8   | Gravelly loam----                                                                               | GC, CL, SC                 | A-6              | 0-5                             | 60-85                                | 50-75  | 45-70  | 35-60 | 25-35           | 10-15                    |
|                                        | 8-20  | Gravelly clay,<br>clay.                                                                         | CH, SC                     | A-7              | 0-5                             | 75-95                                | 55-90  | 50-80  | 45-75 | 50-60           | 25-35                    |
|                                        | 20-60 | Loam, gravelly<br>loam, gravelly<br>sandy loam.                                                 | CL-ML,<br>SM-SC            | A-4, A-2         | 0-5                             | 65-95                                | 55-90  | 40-85  | 25-70 | 20-30           | 5-10                     |

See footnote at end of table.



TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                    | Classification |               | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|-------------------------------------------------|----------------|---------------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                          |       |                                                 | Unified        | AASHTO        |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                          | In    |                                                 |                |               | Pct                             |                                      |        |       |       | Pct             |                          |
| 4070*:<br>Grina-----     | 0-3   | Very gravelly loam.                             | GM-GC, GC      | A-2           | 0-5                             | 45-60                                | 30-45  | 25-40 | 15-30 | 25-35           | 5-15                     |
|                          | 3-14  | Loam, silt loam, silty clay loam.               | CL             | A-6, A-7      | 0                               | 90-100                               | 80-100 | 75-95 | 60-85 | 30-45           | 10-20                    |
|                          | 14-18 | Weathered bedrock                               | ---            | ---           | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 4071*:<br>Genaw-----     | 0-6   | Very fine sandy loam.                           | SM, SM-SC      | A-4           | 0                               | 90-100                               | 85-95  | 75-90 | 35-50 | 15-30           | NP-10                    |
|                          | 6-11  | Gravelly loam, gravelly clay loam.              | GC, SC         | A-6           | 0-5                             | 60-80                                | 55-75  | 45-65 | 35-50 | 25-35           | 10-15                    |
|                          | 11-16 | Very gravelly loam.                             | GM-GC          | A-2           | 0-5                             | 45-55                                | 35-50  | 25-45 | 20-35 | 25-30           | 5-10                     |
|                          | 16    | Weathered bedrock                               | ---            | ---           | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Perlor-----              | 0-7   | Very fine sandy loam.                           | SM, ML         | A-4           | 0-5                             | 85-100                               | 80-100 | 75-90 | 40-55 | 15-25           | NP-5                     |
|                          | 7-14  | Loam, sandy loam, gravelly sandy loam.          | SM, ML         | A-4           | 0-5                             | 75-100                               | 70-95  | 50-80 | 35-65 | 15-25           | NP-5                     |
|                          | 14    | Weathered bedrock                               | ---            | ---           | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Puett-----               | 0-4   | Very gravelly loam.                             | GM             | A-1, A-2      | 0-10                            | 50-60                                | 40-50  | 35-45 | 20-35 | 15-20           | NP-5                     |
|                          | 4-15  | Coarse sandy loam, gravelly loam, sandy loam.   | SM, ML, GM     | A-1, A-2, A-4 | 0                               | 55-95                                | 50-90  | 30-80 | 15-55 | ---             | NP                       |
|                          | 15-19 | Weathered bedrock                               | ---            | ---           | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 4072*:<br>Genaw-----     | 0-6   | Very fine sandy loam.                           | SM, SM-SC      | A-4           | 0                               | 90-100                               | 85-95  | 75-90 | 35-50 | 15-30           | NP-10                    |
|                          | 6-11  | Gravelly loam, gravelly clay loam.              | GC, SC         | A-6           | 0-5                             | 60-80                                | 55-75  | 45-65 | 35-50 | 25-35           | 10-15                    |
|                          | 11-16 | Very gravelly loam.                             | GM-GC          | A-2           | 0-5                             | 45-55                                | 35-50  | 25-45 | 20-35 | 25-30           | 5-10                     |
|                          | 16    | Weathered bedrock                               | ---            | ---           | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Orovada-----             | 0-8   | Fine sandy loam                                 | SM             | A-2, A-4      | 0                               | 95-100                               | 90-100 | 75-95 | 30-50 | ---             | NP                       |
|                          | 8-20  | Fine sandy loam, loam.                          | SM, ML         | A-4           | 0                               | 75-100                               | 75-95  | 60-80 | 40-60 | 20-30           | NP-5                     |
|                          | 20-60 | Stratified fine sandy loam to silt loam.        | SM, ML         | A-4           | 0                               | 75-100                               | 75-95  | 60-85 | 35-55 | 20-30           | NP-5                     |
| Puett-----               | 0-4   | Fine sandy loam                                 | SM             | A-4           | 0                               | 90-100                               | 85-95  | 60-80 | 35-50 | ---             | NP                       |
|                          | 4-15  | Coarse sandy loam, fine sandy loam, sandy loam. | SM, ML         | A-1, A-2, A-4 | 0                               | 80-100                               | 75-95  | 40-80 | 15-55 | ---             | NP                       |
|                          | 15-19 | Weathered bedrock                               | ---            | ---           | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 4091*:<br>Coztur-----    | 0-11  | Loam-----                                       | SM-SC, CL-ML   | A-4           | 0                               | 85-95                                | 80-90  | 70-85 | 45-60 | 20-25           | 5-10                     |
|                          | 11-17 | Loam, clay loam                                 | CL             | A-6           | 0                               | 90-100                               | 85-95  | 70-85 | 50-65 | 30-40           | 10-15                    |
|                          | 17    | Unweathered bedrock.                            | ---            | ---           | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and map symbol | Depth | USDA texture                                  | Classification |          | Frag-<br>ments<br>> 3<br>inches | Percentage passing<br>sieve number-- |        |       |       | Liquid<br>limit | Plas-<br>ticity<br>index |
|--------------------------|-------|-----------------------------------------------|----------------|----------|---------------------------------|--------------------------------------|--------|-------|-------|-----------------|--------------------------|
|                          |       |                                               | Unified        | AASHTO   |                                 | 4                                    | 10     | 40    | 200   |                 |                          |
|                          | In    |                                               |                |          | Pct                             |                                      |        |       |       | Pct             |                          |
| 4091*:<br>Genaw-----     | 0-6   | Very fine sandy loam.                         | SM, SM-SC      | A-4      | 0                               | 90-100                               | 85-95  | 75-90 | 35-50 | 15-30           | NP-10                    |
|                          | 6-11  | Gravelly loam, gravelly clay loam.            | GC, SC         | A-6      | 0-5                             | 60-80                                | 55-75  | 45-65 | 35-50 | 25-35           | 10-15                    |
|                          | 11-16 | Very gravelly loam.                           | GM-GC          | A-2      | 0-5                             | 45-55                                | 35-50  | 25-45 | 20-35 | 25-30           | 5-10                     |
|                          | 16    | Weathered bedrock                             | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 4093*:<br>Coztur-----    | 0-11  | Gravelly loam----                             | GM-GC, SM-SC   | A-2, A-4 | 0-10                            | 60-80                                | 55-75  | 50-70 | 30-50 | 20-25           | 5-10                     |
|                          | 11-17 | Loam, clay loam                               | CL             | A-6      | 0                               | 90-100                               | 85-95  | 70-85 | 50-65 | 30-40           | 10-15                    |
|                          | 17    | Unweathered bedrock.                          | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Teguro-----              | 0-6   | Very gravelly loam.                           | GM             | A-1, A-2 | 0-5                             | 40-55                                | 35-50  | 30-45 | 20-35 | 15-25           | NP-5                     |
|                          | 6-16  | Gravelly clay loam, gravelly loam.            | SC             | A-2, A-6 | 0-10                            | 65-80                                | 50-75  | 35-60 | 30-50 | 30-40           | 15-20                    |
|                          | 16    | Unweathered bedrock.                          | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| Punchbowl-----           | 0-3   | Gravelly loam----                             | SM             | A-2, A-4 | 5-10                            | 65-85                                | 60-75  | 45-60 | 30-45 | 15-25           | NP-5                     |
|                          | 3-7   | Loam, gravelly loam.                          | SC, GC, CL     | A-6      | 0-5                             | 70-100                               | 65-95  | 60-85 | 45-55 | 25-35           | 10-15                    |
|                          | 7-11  | Gravelly clay loam, gravelly sandy clay loam. | GC             | A-6, A-7 | 0-5                             | 55-65                                | 50-60  | 45-55 | 35-45 | 35-45           | 15-20                    |
|                          | 11    | Unweathered bedrock.                          | ---            | ---      | ---                             | ---                                  | ---    | ---   | ---   | ---             | ---                      |
| 4140-----<br>Welch       | 0-4   | Loam-----                                     | CL-ML          | A-4      | 0                               | 95-100                               | 95-100 | 85-95 | 60-70 | 25-30           | 5-10                     |
|                          | 4-60  | Stratified sandy loam to silty clay loam.     | CL             | A-6, A-7 | 0                               | 80-100                               | 75-100 | 65-90 | 50-70 | 35-45           | 15-20                    |

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

| Soil name            | Family or higher taxonomic class                                              |
|----------------------|-------------------------------------------------------------------------------|
| Akerue-----          | Clayey-skeletal, montmorillonitic, frigid, shallow Xerollic Durargids         |
| Alley-----           | Fine-loamy, mixed, mesic Durixerollic Haplargids                              |
| Allor-----           | Fine-loamy, mixed, mesic Durixerollic Haplargids                              |
| Alyan-----           | Fine, montmorillonitic, frigid Aridic Argixerolls                             |
| Antel-----           | Fine-silty, mixed, mesic Duric Camborthids                                    |
| Argenta-----         | Coarse-loamy, mixed (calcareous), mesic Aeris Halaquepts                      |
| Atlow-----           | Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids                       |
| Attella-----         | Loamy-skeletal, mixed (calcareous), frigid Lithic Xeric Torriorthents         |
| Batan-----           | Fine-silty, mixed (calcareous), mesic Durorthidic Torriorthents               |
| Belate-----          | Loamy-skeletal, mixed, frigid Aridic Argixerolls                              |
| Beoska-----          | Fine-loamy, mixed, mesic Duric Natrargids                                     |
| Beowawe-----         | Fine-loamy, mixed, mesic Duric Natrargids                                     |
| Beowawe Variant----- | Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Natrargids        |
| Berning-----         | Clayey-skeletal, montmorillonitic, mesic Xerollic Haplargids                  |
| Bloya-----           | Fine-loamy, mixed, mesic Xerollic Durorthids                                  |
| Blacka-----          | Coarse-loamy, mixed, mesic Entic Durorthids                                   |
| Blackhawk-----       | Loamy, mixed, mesic, shallow Entic Durorthids                                 |
| Bojo-----            | Loamy, mixed, mesic Lithic Haplargids                                         |
| *Boulflat-----       | Fine-loamy, mixed, mesic Haploxerollic Durargids                              |
| Bregar-----          | Loamy-skeletal, mixed, frigid Lithic Xerollic Haplargids                      |
| Broyles-----         | Coarse-loamy, mixed, mesic Duric Camborthids                                  |
| Bubus-----           | Coarse-loamy, mixed (calcareous), mesic Durorthidic Torriorthents             |
| Bucan-----           | Fine, montmorillonitic, frigid Xerollic Haplargids                            |
| Buffaran-----        | Clayey, montmorillonitic, mesic, shallow Xerollic Durargids                   |
| Burnborough-----     | Loamy-skeletal, mixed, frigid Aridic Argixerolls                              |
| Burrita-----         | Clayey-skeletal, montmorillonitic, mesic Lithic Xerollic Haplargids           |
| Caniwe-----          | Fine-silty, mixed, mesic Aridic Duric Haploxerolls                            |
| Chen-----            | Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls                  |
| Cherry Spring-----   | Fine-loamy, mixed, mesic Haploxerollic Durargids                              |
| Chiara-----          | Loamy, mixed, mesic, shallow Xerollic Durorthids                              |
| Clan Alpine-----     | Loamy-skeletal, mixed, frigid Typic Argixerolls                               |
| Cleavage-----        | Loamy-skeletal, mixed, frigid Lithic Argixerolls                              |
| Colbar-----          | Fine-loamy, mixed, mesic Xerollic Haplargids                                  |
| Cortez-----          | Fine, montmorillonitic, mesic Xerollic Nadurargids                            |
| Coztur-----          | Loamy, mixed, frigid Lithic Xerollic Haplargids                               |
| Creemon-----         | Coarse-silty, mixed, mesic Duric Camborthids                                  |
| Cren-----            | Coarse-silty, mixed (calcareous), mesic Durorthidic Torriorthents             |
| Davey-----           | Sandy, mixed, mesic Xerollic Camborthids                                      |
| Desatoya-----        | Clayey over loamy-skeletal, montmorillonitic, mesic Durixerollic Haplargids   |
| Dewar-----           | Loamy, mixed, mesic, shallow Xerollic Durargids                               |
| Doowak-----          | Sandy-skeletal, mixed, mesic Xeric Torriorthents                              |
| Duffer-----          | Fine-silty, carbonatic, mesic Aquic Calcorthids                               |
| Dun Glen-----        | Coarse-loamy, mixed, mesic Typic Camborthids                                  |
| Dunphy-----          | Coarse-loamy, mixed (calcareous), mesic Aeris Halaquepts                      |
| Enko-----            | Coarse-loamy, mixed, mesic Durixerollic Camborthids                           |
| Filiran-----         | Fine, montmorillonitic, mesic Haploxerollic Nadurargids                       |
| Floer-----           | Clayey-skeletal, montmorillonitic, frigid Aridic Palexerolls                  |
| Genaw-----           | Loamy, mixed, mesic, shallow Xerollic Haplargids                              |
| Ginex-----           | Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids                     |
| Glean-----           | Loamy-skeletal, mixed, frigid Pachic Haploxerolls                             |
| Golconda-----        | Fine-loamy, mixed, mesic Haplic Nadurargids                                   |
| Goldrun-----         | Mixed, mesic Xeric Torripsamments                                             |
| Graley-----          | Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls                  |
| Graley Variant-----  | Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls                  |
| Grassval-----        | Loamy, mixed, mesic, shallow Xerollic Durargids                               |
| Grina-----           | Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents                 |
| Gund-----            | Fine-silty over clayey, mixed, nonacid, mesic Aquic Durorthidic Torriorthents |
| Handy-----           | Fine, montmorillonitic, frigid Xerollic Haplargids                            |
| Hapgood-----         | Loamy-skeletal, mixed Pachic Cryoborolls                                      |
| Havingdon-----       | Clayey-skeletal, montmorillonitic, mesic Xerollic Haplargids                  |
| Hessing-----         | Coarse-loamy, mixed, mesic Typic Camborthids                                  |

TABLE 6.--CLASSIFICATION OF THE SOILS--Continued

| Soil name           | Family or higher taxonomic class                                        |
|---------------------|-------------------------------------------------------------------------|
| Hooplite-----       | Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids                 |
| Hopeka-----         | Loamy-skeletal, carbonatic, frigid Lithic Xeric Torriorthents           |
| Humboldt-----       | Fine, montmorillonitic (calcareous), mesic Fluvaquentic Haplaquolls     |
| Humdun-----         | Coarse-loamy, mixed, frigid Durixerollic Camborthids                    |
| Isolde-----         | Mixed, mesic Typic Torripsamments                                       |
| Itca-----           | Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls            |
| Izod-----           | Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents            |
| Jenor-----          | Coarse-loamy, mixed, mesic Typic Durorthids                             |
| Jung-----           | Clayey-skeletal, montmorillonitic, mesic Lithic Xerollic Haplargids     |
| Kelk-----           | Fine-silty, mixed, mesic Durixerollic Camborthids                       |
| Kingingham-----     | Fine, montmorillonitic, mesic Typic Nadurargids                         |
| Kodra-----          | Coarse-loamy, mixed, mesic Haploxerollic Durorthids                     |
| Koynik-----         | Loamy-skeletal, carbonatic, mesic Lithic Torriorthents                  |
| Koynik Variant----- | Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents          |
| Kram-----           | Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents            |
| Kram Variant-----   | Loamy-skeletal, mixed (calcareous), mesic Lithic Xeric Torriorthents    |
| Landco-----         | Coarse-silty over clayey, mixed (calcareous), mesic Typic Torriorthents |
| Laped-----          | Loamy, mixed, mesic, shallow Typic Durargids                            |
| Layview-----        | Loamy-skeletal, mixed Argic Lithic Cryoborolls                          |
| Linrose-----        | Loamy-skeletal, mixed, frigid Aridic Haploxerolls                       |
| Locane-----         | Clayey-skeletal, montmorillonitic, frigid Lithic Xerollic Haplargids    |
| Loncan-----         | Loamy-skeletal, mixed, frigid Aridic Haploxerolls                       |
| Loncan Variant----- | Loamy-skeletal, mixed, frigid Aridic Haploxerolls                       |
| Malpais-----        | Loamy-skeletal, mixed, mesic Typic Camborthids                          |
| McConnel-----       | Sandy-skeletal, mixed, mesic Xerollic Camborthids                       |
| McVegas-----        | Clayey-skeletal, montmorillonitic, mesic, shallow Haplic Nadurargids    |
| Midraw-----         | Clayey, montmorillonitic, mesic, shallow Xerollic Durargids             |
| *Millerlux-----     | Clayey, montmorillonitic, frigid Lithic Xerollic Haplargids             |
| Minat-----          | Loamy-skeletal, mixed, mesic Xerollic Camborthids                       |
| Misad-----          | Loamy-skeletal, mixed (calcareous), mesic Durorthidic Torriorthents     |
| Needle Peak-----    | Fine-silty, mixed (calcareous), mesic Aquic Torriorthents               |
| Newpass-----        | Fine, montmorillonitic, mesic Haploxerollic Nadurargids                 |
| Ninemile-----       | Clayey, montmorillonitic, frigid Lithic Argixerolls                     |
| Norfork-----        | Clayey, montmorillonitic, mesic, shallow Xerollic Durargids             |
| Ocala-----          | Fine-silty, mixed (calcareous), mesic Aeris Halaquepts                  |
| *Old Camp-----      | Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids                 |
| Orovada-----        | Coarse-loamy, mixed, mesic Durixerollic Camborthids                     |
| Osoll-----          | Loamy-skeletal, mixed, mesic, shallow Typic Durorthids                  |
| Osoll Variant-----  | Loamy-skeletal, mixed, mesic Typic Durorthids                           |
| Oxcorel-----        | Fine, montmorillonitic, mesic Duric Natrargids                          |
| Packer-----         | Loamy-skeletal, mixed Argic Cryoborolls                                 |
| Paranat-----        | Fine-silty, mixed (calcareous), mesic Fluvaquentic Haplaquolls          |
| Perlor-----         | Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents           |
| Pernty-----         | Loamy-skeletal, mixed, frigid Lithic Argixerolls                        |
| Perwick-----        | Coarse-loamy, mixed (calcareous), mesic Xeric Torriorthents             |
| Pineval-----        | Loamy-skeletal, mixed, mesic Durixerollic Haplargids                    |
| Prida-----          | Fine-silty, mixed (calcareous), mesic Aquic Durorthidic Torriorthents   |
| Puett-----          | Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents           |
| Pumper-----         | Sandy-skeletal, mixed, mesic Typic Camborthids                          |
| Punchbowl-----      | Loamy, mixed, frigid Lithic Xerollic Haplargids                         |
| Quarz-----          | Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls            |
| Raglan-----         | Fine-loamy, mixed, mesic Duric Camborthids                              |
| Rasille-----        | Coarse-silty, mixed, mesic Durixerollic Camborthids                     |
| Redflame-----       | Loamy-skeletal, mixed, mesic Duric Haplargids                           |
| Rednik-----         | Loamy-skeletal, mixed, mesic Typic Haplargids                           |
| Reese-----          | Fine-loamy, mixed (calcareous), mesic Aeris Halaquepts                  |
| Reina-----          | Clayey-skeletal, montmorillonitic, mesic, shallow Xerollic Durargids    |
| Relley-----         | Fine-silty, mixed, mesic Duric Camborthids                              |
| Reluctan-----       | Fine-loamy, mixed, frigid Aridic Argixerolls                            |
| Ricert-----         | Fine-loamy, mixed, mesic Duric Natrargids                               |
| Rixie-----          | Fine-loamy, mixed, mesic Aquic Duric Haploxerolls                       |
| Robson-----         | Clayey-skeletal, montmorillonitic, frigid Lithic Xerollic Haplargids    |
| Roca-----           | Clayey-skeletal, montmorillonitic, frigid Xerollic Haplargids           |
| Rose Creek-----     | Coarse-loamy, mixed, mesic Fluvaquentic Haploxerolls                    |

TABLE 6.--CLASSIFICATION OF THE SOILS--Continued

| Soil name            | Family or higher taxonomic class                                                     |
|----------------------|--------------------------------------------------------------------------------------|
| Rosney-----          | Fine-silty, mixed (calcareous), mesic Typic Torriorthents                            |
| Settlemyer-----      | Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls                                    |
| Shabliss-----        | Loamy, mixed, mesic, shallow Haploxerollic Durorthids                                |
| Skullwak-----        | Fine, montmorillonitic (calcareous), mesic Aeris Halaquepts                          |
| Slaven-----          | Clayey-skeletal, montmorillonitic, frigid Aridis Argixerolls                         |
| Snapp-----           | Clayey over sandy or sandy-skeletal, montmorillonitic, mesic Durixerollic Natrargids |
| Sodhouse-----        | Loamy, mixed, mesic, shallow Typic Durorthids                                        |
| Softscrabble-----    | Loamy-skeletal, mixed, frigid Pachic Argixerolls                                     |
| Sombrero-----        | Loamy, mixed, mesic, shallow Aquentic Durorthids                                     |
| Sonoma-----          | Fine-silty, mixed (calcareous), mesic Aeris Fluvaquents                              |
| Sonoma Variant-----  | Coarse-silty, mixed (calcareous), mesic Typic Fluvaquents                            |
| Soolake-----         | Sandy, mixed, mesic Typic Torriorthents                                              |
| Spike-----           | Loamy-skeletal, mixed, mesic Typic Haplargids                                        |
| Stingdorn-----       | Loamy-skeletal, mixed, mesic, shallow Typic Durargids                                |
| Sumine-----          | Loamy-skeletal, mixed, frigid Aridis Argixerolls                                     |
| Susie Creek-----     | Fine, montmorillonitic, frigid Durargidic Argixerolls                                |
| Teguro-----          | Loamy, mixed, frigid Lithic Argixerolls                                              |
| Teman-----           | Fine-silty, mixed, mesic Durixerollic Calciorthids                                   |
| Tenabo-----          | Loamy, mixed, mesic, shallow Typic Nadurargids                                       |
| Tessfive-----        | Loamy, mixed (calcareous), mesic Lithic Xeric Torriorthents                          |
| Tomera-----          | Fine, montmorillonitic, mesic Xerollic Natrargids                                    |
| Trunk-----           | Fine, montmorillonitic, mesic Xerollic Haplargids                                    |
| Tulase-----          | Coarse-silty, mixed (calcareous), mesic Durorthidic Xeric Torriorthents              |
| Tusel-----           | Loamy-skeletal, mixed Argic Pachic Cryoborolls                                       |
| *Tweba-----          | Coarse-loamy, mixed (calcareous), mesic Aeris Fluvaquents                            |
| Umberland-----       | Fine, montmorillonitic (calcareous), mesic Aeris Halaquepts                          |
| Unsel Variant-----   | Fine-loamy, mixed, mesic Duric Haplargids                                            |
| Valmy-----           | Coarse-loamy, mixed (calcareous), mesic Durorthidic Torriorthents                    |
| Vanwyper-----        | Clayey-skeletal, montmorillonitic, mesic Xerollic Haplargids                         |
| Veta-----            | Loamy-skeletal, mixed, mesic Xerollic Camborthids                                    |
| Walti-----           | Fine, montmorillonitic, frigid Aridis Argixerolls                                    |
| *Welch-----          | Fine-loamy, mixed, frigid Cumulic Haplaquolls                                        |
| Wendane-----         | Fine-silty, mixed (calcareous), mesic Aeris Halaquepts                               |
| Wendane Variant----- | Loamy-skeletal, mixed (calcareous), mesic Aeris Halaquepts                           |
| *Weso-----           | Coarse-loamy, mixed, mesic Duric Camborthids                                         |
| Whirlo-----          | Loamy-skeletal, mixed, mesic Typic Camborthids                                       |
| Wholan-----          | Coarse-silty, mixed, mesic Typic Camborthids                                         |
| Wieland-----         | Fine, montmorillonitic, mesic Durixerollic Haplargids                                |
| Winada-----          | Loamy-skeletal, mixed Argic Cryoborolls                                              |
| Winada Variant-----  | Loamy-skeletal, mixed Argic Cryoborolls                                              |
| Wiskan-----          | Loamy-skeletal, mixed, frigid Xerollic Haplargids                                    |
| Xine-----            | Loamy-skeletal, mixed, frigid Aridis Calcixerolls                                    |
| Yipor-----           | Coarse-silty, mixed (calcareous), mesic Typic Torriorthents                          |
| Zineb-----           | Loamy-skeletal, mixed, mesic Durixerollic Camborthids                                |
| Zoesta-----          | Fine, montmorillonitic, frigid Xerollic Paleargids                                   |
| Zoesta Variant-----  | Fine, montmorillonitic, mesic Xerollic Paleargids                                    |



# **Rangeland Plants and Woodland Understory**

## 102--Beowawe Variant-Tomera-Whirlo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name        | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |        |        |                    |       |
|--------------------------|--------------|--------------------------------------------------------------------------------------------|--------|--------|--------------------|-------|
|                          |              | Soil name                                                                                  |        |        | Inclusion number-- |       |
|                          |              | Beowawe Variant                                                                            | Tomera | Whirlo | 1                  | 2     |
| Thurber needlegrass      | STTH2        | 10-20                                                                                      | 20-50  | ---    | 10-20              | 20-50 |
| Indian ricegrass         | ORHY         | 5-15                                                                                       | ---    | 5-15   | 5-15               | ---   |
| Bottlebrush squirreltail | SIHY         | 2-10                                                                                       | ---    | 5-15   | 2-10               | ---   |
| Sandberg bluegrass       | POSE         | 2-10                                                                                       | ---    | 2-5    | 2-10               | ---   |
| Bluebunch wheatgrass     | AGSP         | ---                                                                                        | 5-10   | ---    | ---                | 5-10  |
| Needleandthread          | STCO4        | ---                                                                                        | ---    | 1-3    | ---                | ---   |
| Tapertip hawksbeard      | CRAC2        | 1-2                                                                                        | 2-4    | ---    | 1-2                | 2-4   |
| Globemallow              | SPHAE        | 1-2                                                                                        | ---    | ---    | 1-2                | ---   |
| Phlox                    | PHLOX        | 1-2                                                                                        | ---    | ---    | 1-2                | ---   |
| Balsamroot               | BALSA        | ---                                                                                        | 2-4    | ---    | ---                | 2-4   |
| Other perennial forbs    | PPFF         | ---                                                                                        | ---    | 2-8    | ---                | ---   |
| Wyoming big sagebrush    | ARTRW*       | 30-35                                                                                      | 15-20  | ---    | 30-35              | 15-20 |
| Spiny hopsage            | GRSP         | 5-15                                                                                       | 2-5    | 2-5    | 5-15               | 2-5   |
| Downy rabbitbrush        | CHVIP        | ---                                                                                        | 2-5    | ---    | ---                | 2-5   |
| Shadscale                | ATCO         | ---                                                                                        | ---    | 30-40  | ---                | ---   |
| Bud sagebrush            | ARSP5        | ---                                                                                        | ---    | 20-30  | ---                | ---   |
| Winterfat                | EULA5        | ---                                                                                        | ---    | 2-5    | ---                | ---   |
| Other shrubs             | SSSS         | ---                                                                                        | 2-10   | ---    | ---                | 2-10  |

| Range site number               | 024X020N | 024X005N | 024X002N | 024X020N | 024X005N |
|---------------------------------|----------|----------|----------|----------|----------|
| Potential production (lb/acre): |          |          |          |          |          |
| Favorable years                 | 700      | 800      | 700      | 700      | 800      |
| Normal years                    | 450      | 600      | 450      | 450      | 600      |
| Unfavorable years               | 300      | 400      | 300      | 300      | 400      |



## 112--Millerlux-Reluctan-Cleavage association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name        | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |     |       |       |
|--------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|-----|-------|-------|
|                          |              | Soil name                                                                                  |          |          | Inclusion number-- |     |       |       |
|                          |              | Millerlux                                                                                  | Reluctan | Cleavage | 1                  | 2   | 3     | 4     |
| Bluebunch wheatgrass     | AGSP         | 15-20                                                                                      | 20-30    | 15-30    | 20-50              | --- | ---   | ---   |
| Thurber needlegrass      | STTH2        | 15-20                                                                                      | 2-10     | 2-10     | ---                | --- | ---   | ---   |
| Webber ricegrass         | ORWE         | 5-10                                                                                       | ---      | ---      | 2-5                | --- | ---   | ---   |
| Sandberg bluegrass       | POSE         | 5-8                                                                                        | ---      | ---      | ---                | --- | 5-10  | ---   |
| Pine bluegrass           | POSC         | 5-8                                                                                        | ---      | ---      | ---                | --- | 2-5   | ---   |
| Cusick bluegrass         | POCU3        | 5-8                                                                                        | ---      | ---      | ---                | --- | 2-5   | ---   |
| Idaho fescue             | FEID         | ---                                                                                        | ---      | ---      | ---                | --- | 2-5   | ---   |
| Basin wildrye            | ELCI2        | ---                                                                                        | 20-40    | 25-50    | 1-10               | --- | 10-20 | ---   |
| Spike fescue             | HEKI         | ---                                                                                        | 2-15     | ---      | 5-10               | --- | ---   | 50-60 |
| Mountain brome           | BRMA4        | ---                                                                                        | ---      | 2-10     | ---                | --- | ---   | ---   |
| Bottlebrush squirreltail | SIHY         | ---                                                                                        | ---      | ---      | 2-15               | --- | ---   | ---   |
| Nevada bluegrass         | PONE3        | ---                                                                                        | ---      | ---      | 2-5                | --- | 5-10  | ---   |
| Mat muhly                | MURI         | ---                                                                                        | ---      | ---      | ---                | --- | ---   | 5-15  |
| Sedge                    | CAREX        | ---                                                                                        | ---      | ---      | ---                | --- | ---   | 2-10  |
| Other perennial grasses  | PPGG         | ---                                                                                        | ---      | ---      | ---                | --- | ---   | 1-5   |
|                          |              |                                                                                            |          |          |                    |     |       | 15-20 |
| Balsamroot               | BALSA        | 2-5                                                                                        | ---      | 2-5      | ---                | --- | ---   | ---   |
| Eriogonum                | ERIOG        | 1-3                                                                                        | ---      | ---      | ---                | --- | ---   | ---   |
| Phlox                    | PHLOX*       | 1-3                                                                                        | ---      | ---      | ---                | --- | ---   | ---   |
| Tapertip hawksbeard      | CRAC2        | ---                                                                                        | 1-5      | ---      | ---                | --- | 2-5   | ---   |
| Arrowleaf balsamroot     | BASA3        | ---                                                                                        | 1-5      | ---      | 2-5                | --- | ---   | ---   |
| Goldenweed               | HAPLO2       | ---                                                                                        | ---      | ---      | 2-5                | --- | ---   | ---   |
| Other perennial forbs    | PFFF         | ---                                                                                        | ---      | ---      | ---                | --- | 2-5   | ---   |
|                          |              |                                                                                            |          |          |                    |     |       | 5-10  |
| Low sagebrush            | ARAR8        | 20-30                                                                                      | ---      | 10-20    | ---                | --- | 5-15  | ---   |
| Mountain big sagebrush   | ARTRV        | ---                                                                                        | 5-15     | ---      | 5-15               | --- | ---   | ---   |
| Douglas rabbitbrush      | CHVI8        | ---                                                                                        | ---      | 2-5      | ---                | --- | ---   | ---   |
| Black sagebrush          | ARARN        | ---                                                                                        | ---      | ---      | ---                | --- | 5-15  | ---   |
| Basin big sagebrush      | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | --- | ---   | 10-15 |

|                                 |          |         |          |          |      |          |          |
|---------------------------------|----------|---------|----------|----------|------|----------|----------|
| Range site number               | 024X018N | 24X021N | 024X027N | 024X029N | None | 024X016N | 025X003N |
| Potential production (lb/acre): |          |         |          |          |      |          |          |
| Favorable years                 | 700      | 1,400   | 1,200    | 1,500    | ---  | 350      | 2,500    |
| Normal years                    | 500      | 1,000   | 800      | 1,100    | ---  | 250      | 1,900    |
| Unfavorable years               | 300      | 700     | 600      | 800      | ---  | 150      | 1,200    |

## 120--Alyan-Graley-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |
|                                 |              | Alyan                                                                                      | Graley   | Rock outcrop | 1                  | 2        |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | 15-30    | ---          | ---                | ---      |
| Thurber needlegrass             | STTH2        | 15-25                                                                                      | T-10     | ---          | ---                | ---      |
| Nevada bluegrass                | PONE3        | 2-10                                                                                       | 2-5      | ---          | ---                | 5-15     |
| Idaho fescue                    | FEID         | ---                                                                                        | 15-40    | ---          | ---                | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-10     | ---          | ---                | 50-60    |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---          | 10-30              | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---          | 5-10               | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---          | ---                | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---          | ---                | 1-5      |
| Other perennial grasses         | PPGG         | 10-15                                                                                      | 5-10     | ---          | 10-20              | 15-20    |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 1-5      | ---          | ---                | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 5-10     | ---          | ---                | ---      |
| Other perennial forbs           | PPFF         | 2-5                                                                                        | 5-15     | ---          | 5-15               | 5-10     |
| Big sagebrush                   | ARTR2        | 10-15                                                                                      | ---      | ---          | ---                | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 10-15    | ---          | ---                | ---      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | 5-15     | ---          | 1-5                | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---          | 1-5                | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---          | 1-5                | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---          | 5-15               | ---      |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | ---          | T-5                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---          | 10-25              | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---          | ---                | 10-15    |
| Other shrubs                    | SSSS         | 5-10                                                                                       | 5-15     | ---          | 2-4                | 2-5      |
| Range site number               |              | 025X014N                                                                                   | 025X012N | None         | 025X025N           | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |
| Favorable years                 |              | 1,000                                                                                      | 1,200    | ---          | 200                | 2,500    |
| Normal years                    |              | 800                                                                                        | 900      | ---          | 150                | 1,900    |
| Unfavorable years               |              | 600                                                                                        | 600      | ---          | 100                | 1,200    |

## 130--Alley-Dewar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |      |
|                                 |              | Alley                                                                                      | Dewar    | 1                  | 2    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50              | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10               | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4                | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4                | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20              | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5                | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10               | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N           | None |
| Potential production (lb/acre): |              |                                                                                            |          |                    |      |
| Favorable years                 |              | 800                                                                                        | 800      | 800                | ---  |
| Normal years                    |              | 600                                                                                        | 600      | 600                | ---  |
| Unfavorable years               |              | 400                                                                                        | 400      | 400                | ---  |

## 131--Alley-Rock outcrop-Rubble land association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |             |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|-------------|--------------------|----------|
|                                 |              | Soil name                                                                                  |              |             | Inclusion number-- |          |
|                                 |              | Alley                                                                                      | Rock outcrop | Rubble land | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---          | ---         | 20-50              | 20-50    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---          | ---         | 5-10               | 5-10     |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---          | ---         | 2-4                | 2-4      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---          | ---         | 2-4                | 2-4      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---          | ---         | 15-20              | 15-20    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---          | ---         | 2-5                | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---          | ---         | 2-5                | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---          | ---         | 2-10               | 2-10     |
| Range site number               |              | 024X005N                                                                                   | None         | None        | 024X005N           | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |              |             |                    |          |
| Favorable years                 |              | 800                                                                                        | ---          | ---         | 800                | 800      |
| Normal years                    |              | 600                                                                                        | ---          | ---         | 600                | 600      |
| Unfavorable years               |              | 400                                                                                        | ---          | ---         | 400                | 400      |

## 140--Antel silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Antel                                                                                      | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-10               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---                | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---                | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---                | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10               | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-50              | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 5-15               | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---                | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---                | 2-5      |
| Black greasewood                | SAVE4        | ---                                                                                        | 15-30              | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15               | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X003N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 700                                                                                        | 600                | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      |

## 141--Antel silt loam, moderately sodic

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Antel                                                                                      | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 10-20    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 60-70    |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 700                                                                                        | 700                | 500      |
| Normal years                    |              | 450                                                                                        | 450                | 350      |
| Unfavorable years               |              | 300                                                                                        | 300                | 200      |

## 142--Antel silty clay loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Antel                                                                                      | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3                | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      |
| Shadscale                       | ATC0         | 30-40                                                                                      | 30-40              | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      |

## 143--Antel silty clay loam, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Antel                                                                                      | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | ---                | ---      |
| Western wheatgrass              | AGSM         | 5-15                                                                                       | ---                | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 10-20              | 5-15     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-10               | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---                | 2-5      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | 1-4      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | 1-4      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8                | ---      |
| Basin big sagebrush             | ARTRT*       | 15-20                                                                                      | ---                | ---      |
| Black greasewood                | SAVE4        | 2-10                                                                                       | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | 2-5                                                                                        | ---                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 60-70              | 20-40    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 2-5                | 20-30    |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 2-5      |
| Range site number               |              | 024X006N                                                                                   | 024X004N           | 024X014N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 1,500                                                                                      | 500                | 400      |
| Normal years                    |              | 1,100                                                                                      | 350                | 300      |
| Unfavorable years               |              | 600                                                                                        | 200                | 200      |



## 150--Argenta very fine sandy loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Argenta                                                                                    | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 5-15                                                                                       | ---                | 2-5      | 40-60    |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Wildrye                         | ELMYU        | ---                                                                                        | 30-60              | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 5-10               | ---      | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | 2-10               | ---      | ---      |
| Arrowgrass                      | TRIGL        | ---                                                                                        | ---                | 1-3      | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | 15-40    | 15-30    |
| Alkali muhly                    | MUAS         | ---                                                                                        | ---                | 10-20    | ---      |
| Alkali bluegrass                | POJU         | ---                                                                                        | ---                | 5-15     | ---      |
| Alkali cordgrass                | SPGR         | ---                                                                                        | ---                | 5-10     | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-15               | ---      | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | 2-5                | ---      | ---      |
| Other perennial forbs           | PPFF         | T-5                                                                                        | 5-10               | ---      | ---      |
| Black greasewood                | SAVE4        | 60-75                                                                                      | ---                | T-2      | 5-15     |
| Willow                          | SALIX        | ---                                                                                        | 5-10               | T-2      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 2-5                | ---      | ---      |
| Silver sagebrush                | ARCA13       | ---                                                                                        | 2-5                | ---      | ---      |
| Silver buffaloberry             | SHAR         | ---                                                                                        | ---                | T-2      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---                | T-2      | 1-2      |
| Woods rose                      | ROWO         | ---                                                                                        | ---                | T-2      | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---                | ---      | 1-2      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-8                | ---      | ---      |
| Range site number               |              | 024X011N                                                                                   | 025X001N           | 024X009N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 3,000              | 1,500    | 1,900    |
| Normal years                    |              | 350                                                                                        | 2,500              | 1,000    | 1,400    |
| Unfavorable years               |              | 200                                                                                        | 1,800              | 700      | 800      |

## 152--Argenta-Sonoma complex

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |
|                                 |              | Argenta                                                                                    | Sonoma   | 1                  |
| Basin wildrye                   | ELCI2        | 5-15                                                                                       | 40-60    | ---                |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10     | 5-10               |
| Alkali sacaton                  | SPAI         | ---                                                                                        | 15-30    | ---                |
| Wildrye                         | ELMYU        | ---                                                                                        | ---      | 30-60              |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 5-10               |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | 2-10               |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 5-15               |
| Sierra clover                   | TRWO         | ---                                                                                        | ---      | 2-5                |
| Other perennial forbs           | PPFF         | T-5                                                                                        | ---      | 5-10               |
| Black greasewood                | SAVE4        | 60-75                                                                                      | 5-15     | ---                |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | 1-2      | ---                |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-2      | ---                |
| Willow                          | SALIX        | ---                                                                                        | ---      | 5-10               |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 2-5                |
| Silver sagebrush                | ARCA13       | ---                                                                                        | ---      | 2-5                |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-8                |
| Range site number               |              | 024X011N                                                                                   | 024X007N | 025X001N           |
| Potential production (lb/acre): |              |                                                                                            |          |                    |
| Favorable years                 |              | 500                                                                                        | 1,900    | 3,000              |
| Normal years                    |              | 350                                                                                        | 1,400    | 2,500              |
| Unfavorable years               |              | 200                                                                                        | 800      | 1,800              |

## 160--Batan fine sandy loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Batan                                                                                      | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 5-15     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---                | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---                | 2-5      |
| Needleandthread                 | STC04        | ---                                                                                        | ---                | 1-3      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10               | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50              | 30-40    |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30              | ---      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15               | 20-30    |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15               | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---                | 2-5      |
| Winterfat                       | EULA5        | ---                                                                                        | ---                | 2-5      |
| Range site number               |              | 024X003N                                                                                   | 024X003N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 600                                                                                        | 600                | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      |

## 161--Batan silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Batan                                                                                      | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 5-10     | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---                | 10-30    | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | T-5      | 15-30    |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---                | ---      | 40-60    |
| Inland saltgrass                | DIST         | ---                                                                                        | ---                | ---      | 5-10     |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10               | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | T-5      | ---      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50              | ---      | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30              | ---      | 5-15     |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15               | ---      | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15               | ---      | ---      |
| Saltbush                        | ATRIp        | ---                                                                                        | ---                | 50-65    | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---                | ---      | 1-2      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---                | ---      | 1-2      |
| Range site number               |              | 024X003N                                                                                   | 024X003N           | 024X012N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 600                                                                                        | 600                | 700      | 1,900    |
| Normal years                    |              | 450                                                                                        | 450                | 400      | 1,400    |
| Unfavorable years               |              | 300                                                                                        | 300                | 200      | 800      |

162--Batan silt loam, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Batan                                                                                      | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-20                                                                                      | 5-15               | 5-15     | 10-20    |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 2-10               | 5-15     | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---                | 1-3      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | 1-4                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 1-4                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---                | 2-8      | 2-8      |
| Winterfat                       | EULA5        | 60-70                                                                                      | 20-40              | 2-5      | 60-70    |
| Bud sagebrush                   | ARSP5        | 2-5                                                                                        | 20-30              | 20-30    | 2-5      |
| Shadscale                       | ATCO         | ---                                                                                        | 2-5                | 30-40    | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---                | 2-5      | ---      |
| Range site number               |              | 024X004N                                                                                   | 024X014N           | 024X002N | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 400                | 700      | 500      |
| Normal years                    |              | 350                                                                                        | 300                | 450      | 350      |
| Unfavorable years               |              | 200                                                                                        | 200                | 300      | 200      |

## 163--Batan silt loam, slightly saline

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Batan                                                                                      | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-10               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---                | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---                | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---                | 1-3      | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10               | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-50              | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 5-15               | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---                | 2-5      | 2-5      |
| Black greasewood                | SAVE4        | ---                                                                                        | 15-30              | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15               | ---      | ---      |
| Range site number               |              | O24X002N                                                                                   | O24X003N           | O24X002N | O24X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 600                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

## 164--Batan-Raglan-Rosney association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Batan                                                                                      | Raglan   | Rosney   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10     | 5-10     | 5-15               | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 10-30    | 5-15               | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---      | T-5      | ---                | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | 2-5                | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | 1-3                | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | 50-60    |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | 5-15     |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10     | ---      | ---                | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | T-5      | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50    | ---      | 30-40              | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30    | ---      | ---                | 2-10     |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15     | ---      | 20-30              | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15     | ---      | ---                | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---      | 50-65    | ---                | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | 2-5                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | 2-5                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 15-20    |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Range site number               |              | 024X003N                                                                                   | 024X003N | 024X012N | 024X002N           | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 600                                                                                        | 600      | 700      | 700                | 1,500    |
| Normal years                    |              | 450                                                                                        | 450      | 400      | 450                | 1,100    |
| Unfavorable years               |              | 300                                                                                        | 300      | 200      | 300                | 600      |

## 166--Batan-Wendane-Sonoma association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Batan                                                                                      | Wendane  | Sonoma   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---      | ---      | ---                | 2-5      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 40-60    | ---      | 50-60              | 5-20     |
| Alkali sacaton                  | SPAI         | ---                                                                                        | 15-30    | ---      | ---                | ---      |
| Inland saltgrass                | DIST         | ---                                                                                        | 5-10     | 5-10     | ---                | ---      |
| Wildrye                         | ELMYU        | ---                                                                                        | ---      | 30-60    | ---                | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 5-10     | ---                | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | 2-10     | ---                | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | 5-15               | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---      | 5-15     | ---                | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | ---      | 2-5      | ---                | ---      |
| Thelypody                       | THELY        | ---                                                                                        | ---      | ---      | ---                | 2-4      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | 5-10     | 2-8                | ---      |
| Shadscale                       | ATCO         | 30-50                                                                                      | ---      | ---      | ---                | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 5-15     | ---      | 2-10               | 20-30    |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | ---      | ---      | ---                | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---      | ---      | ---                | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | 1-2      | ---      | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-2      | ---      | 2-5                | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---      | 5-10     | ---                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 2-5      | 15-20              | 5-15     |
| Silver sagebrush                | ARCA13       | ---                                                                                        | ---      | 2-5      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | ---                | 5-10     |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | ---                | 5-15     |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-8      | ---                | ---      |
| Range site number               |              | 024X003N                                                                                   | 024X007N | 025X001N | 024X006N           | 024X022N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 600                                                                                        | 1,900    | 3,000    | 1,500              | 800      |
| Normal years                    |              | 450                                                                                        | 1,400    | 2,500    | 1,100              | 600      |
| Unfavorable years               |              | 300                                                                                        | 800      | 1,800    | 600                | 350      |



## 167--Batan-Wendane-Valmy association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Batan                                                                                      | Wendane  | Valmy    | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---      | 2-5      | 5-10               | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 20-40    | 5-20     | ---                | 50-60    |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 2-5      | ---                | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | 5-15     |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---      | ---      | T-10               | ---      |
| Thelypody                       | THELY        | ---                                                                                        | ---      | 2-4      | ---                | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---      | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | ---      | ---      | 30-50              | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 5-15     | 20-30    | 15-30              | 2-10     |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | ---      | ---      | 5-15               | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---      | ---      | 2-15               | ---      |
| Torrey quailbush                | ATTO         | ---                                                                                        | 30-50    | ---      | ---                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 2-10     | 5-15     | ---                | 15-20    |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 5-10     | ---                | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 5-15     | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Range site number               |              | 024X003N                                                                                   | 024X015N | 024X022N | 024X003N           | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 600                                                                                        | 1,500    | 800      | 600                | 1,500    |
| Normal years                    |              | 450                                                                                        | 1,200    | 600      | 450                | 1,100    |
| Unfavorable years               |              | 300                                                                                        | 800      | 350      | 300                | 600      |

## 168--Batan-Bubus-Ocala association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Batan                                                                                      | Bubus    | Ocala    | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10     | ---      | ---                | 5-15     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 40-60    | 50-60              | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---      | 15-30    | ---                | ---      |
| Inland saltgrass                | DIST         | ---                                                                                        | ---      | 5-10     | ---                | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | 5-15               | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | ---                | 1-3      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10     | ---      | ---                | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | ---      | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50    | ---      | ---                | 30-40    |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30    | 5-15     | 2-10               | ---      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15     | ---      | ---                | 20-30    |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15     | ---      | ---                | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---      | 1-2      | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | 1-2      | 2-5                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | 15-20              | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Range site number               |              | 024X003N                                                                                   | 024X003N | 024X007N | 024X006N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 600                                                                                        | 600      | 1,900    | 1,500              | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 1,400    | 1,100              | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 800      | 600                | 300      |

## 169--Batan-Ocala-Ocala, rarely flooded, association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                       |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|-----------------------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |          |                       | Inclusion number-- |      |          |
|                                 |              | Batan                                                                                      | Ocala    | Ocala, rarely flooded | 1                  | 2    | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---      | ---                   | ---                | ---  | 2-10     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 40-60    | 5-15                  | 50-60              | ---  | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | 15-30    | ---                   | ---                | ---  | ---      |
| Inland saltgrass                | DIST         | ---                                                                                        | 5-10     | 5-10                  | ---                | ---  | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---                   | 5-15               | ---  | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---                   | ---                | ---  | 10-20    |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---                   | ---                | ---  | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---                   | ---                | ---  | 2-10     |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---      | ---                   | ---                | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---                   | ---                | ---  | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                   | ---                | ---  | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                   | ---                | ---  | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | T-5                   | 2-8                | ---  | ---      |
| Shadscale                       | ATCO         | 30-50                                                                                      | ---      | ---                   | ---                | ---  | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 5-15     | 60-75                 | 2-10               | ---  | ---      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | ---      | ---                   | ---                | ---  | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---      | ---                   | ---                | ---  | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | 1-2      | ---                   | ---                | ---  | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-2      | ---                   | 2-5                | ---  | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                   | 15-20              | ---  | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---                   | ---                | ---  | 30-35    |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---                   | ---                | ---  | 5-15     |
| Range site number               |              | 024X003N                                                                                   | 024X007N | 024X011N              | 024X006N           | None | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                       |                    |      |          |
| Favorable years                 |              | 600                                                                                        | 1,900    | 500                   | 1,500              | ---  | 700      |
| Normal years                    |              | 450                                                                                        | 1,400    | 350                   | 1,100              | ---  | 450      |
| Unfavorable years               |              | 300                                                                                        | 800      | 200                   | 600                | ---  | 300      |

## 170--Beoska silt loam, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Beoska                                                                                     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Range site number               |              | O24X002N                                                                                   | O24X002N           | O24X002N | O24X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

## 171--Beoska silt loam, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Beoska                                                                                     | 1                  | 2        | 3        | 4        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | 1-3      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | ---      | ---      | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | ---      | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | ---      | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | ---      | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---                | ---      | ---      | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X002N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      | 300      |

## 172--Beoska-Tenabo silt loams, nearly level

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Beoska                                                                                     | Tenabo   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-10               | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20              | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2                | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 30-35              | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X020N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      |

## 173--Beoska-Tenabo silt loams, sloping

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Beoska                                                                                     | Tenabo   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15               | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---                | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30              | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---                | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N           | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      |

## 174--Beoska-Chiara association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Beoska                                                                                     | Chiara   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | 2-10               | ---      | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | 5-15               | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | 2-10               | ---      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | ---                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | 10-20              | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---                | ---      | ---      |
| Basin wildrye                   | ELC12        | ---                                                                                        | ---      | ---                | 30-50    | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | 15-25    | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | 1-2                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | ---                | 2-5      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | ---                | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | ---                | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | ---      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | ---                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | 30-35              | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | 5-10     | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---                | 5-10     | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X005N | 024X020N           | 028B003N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 800      | 700                | 2,600    | 700      |
| Normal years                    |              | 450                                                                                        | 600      | 450                | 1,250    | 450      |
| Unfavorable years               |              | 300                                                                                        | 400      | 300                | 800      | 300      |



## 175--Beoska-Jenor association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Beoska                                                                                     | Jenor    | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3      | ---                | 1-3      | 1-3      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-4                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-4                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 2-5                | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30              | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 20-40              | 2-5      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X014N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 400                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 300                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 200                | 300      | 300      |

## 177--Beoska-Oxcorel-McConnel association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Beoska                                                                                     | Oxcorel  | McConnel | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10     | 5-15               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-10     | 2-5                | 2-5      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---      | 1-3                | 1-3      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20    | ---                | ---      | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2      | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2      | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2      | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---      | 2-8                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---      | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---      | 20-30              | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15     | 2-5                | 2-5      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---      | 2-5                | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 30-35    | ---                | ---      | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X020N | 024X002N           | 024X002N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      | 300      |

## 178--Beoska-Malpais-Old Camp association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |      |
|                                 |              | Beoska                                                                                     | Malpais  | Old Camp | 1                  | 2    | 3        | 4    |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 2-10     | ---      | 2-10               | ---  | 5-10     | ---  |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 2-10     | ---      | 5-15               | ---  | 10-30    | ---  |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---      | 2-10               | ---  | ---      | ---  |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | ---      | ---                | ---  | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | 2-10     | ---      | ---                | ---  | ---      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 2-5      | 20-50    | 10-20              | ---  | ---      | ---  |
| Desert needlegrass              | STSP3        | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | 5-10     | ---                | ---  | ---      | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---  | 10-20    | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-2      | ---      | ---                | ---  | ---      | ---  |
| Hawksbeard                      | CREPI        | ---                                                                                        | 1-2      | ---      | ---                | ---  | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4      | ---                | ---  | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 2-4      | 1-2                | ---  | ---      | ---  |
| Globeamallow                    | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---  | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---  | ---      | ---  |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | ---      | ---                | ---  | 5-15     | ---  |
| Shadscale                       | ATCO         | 30-40                                                                                      | 10-25    | ---      | ---                | ---  | ---      | ---  |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 2-5      | ---      | ---                | ---  | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-15     | 2-5      | 5-15               | ---  | 1-5      | ---  |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | ---      | ---                | ---  | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 10-25    | 15-20    | 30-35              | ---  | 10-25    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 2-5      | ---                | ---  | 1-5      | ---  |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | ---      | ---                | ---  | 1-5      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | ---  | 5-15     | ---  |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | ---      | ---                | ---  | T-5      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-10     | ---                | ---  | 2-4      | ---  |
| Range site number               |              | 024X002N                                                                                   | 024X026N | 024X005N | 024X020N           | None | 025X025N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |      |
| Favorable years                 |              | 700                                                                                        | 400      | 800      | 700                | ---  | 200      | ---  |
| Normal years                    |              | 450                                                                                        | 300      | 600      | 450                | ---  | 150      | ---  |
| Unfavorable years               |              | 300                                                                                        | 200      | 400      | 300                | ---  | 100      | ---  |

## 181--Beoska-Orovada association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Beoska                                                                                     | Orovada  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 2-10     | 2-10               | ---      | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-10     | 2-10               | ---      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | ---                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 10-20    | 10-20              | 20-50    | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | ---                | 5-10     | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-2      | 1-2                | 2-4      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | 1-2      | 1-2                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 1-2      | 1-2                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---                | 2-4      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | ---                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | ---                | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | ---                | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-15     | 5-15               | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | ---                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 30-35    | 30-35              | 15-20    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---                | 2-10     | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X020N | 024X020N           | 024X005N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 800      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 600      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 400      | 300      |

## 182--Beoska-Whirlo-Misad association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Beoska                                                                                     | Whirlo   | Misad    | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 2-10               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-10               | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | ---                | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | 10-20              | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 1-2                | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | ---                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | ---                | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | ---                | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | ---                | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | 30-35              | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X020N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      |

## 183--Beoska-Dewar-Orovada association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Beoska                                                                                     | Dewar    | Orovada  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | 5-10     | 5-15               | ---      | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | 20-30    | 5-15               | ---      | 15-30    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | 2-5      | 2-5                | ---      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | 10-20    | 1-3                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | ---      | ---                | 20-50    | 5-10     |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---      | ---                | 5-10     | ---      |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---      | ---                | ---      | T-2      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---      | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---      | ---                | 2-4      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-4      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | 2-5      | 2-8                | ---      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | ---      | 30-40              | ---      | 2-5      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | ---      | 20-30              | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---      | 2-5                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | 15-20    | ---                | 15-20    | 15-30    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---      | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | 5-15     | ---                | 2-10     | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X005N | 028B010N | 024X002N           | 024X005N | 024X045N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 800      | 800      | 700                | 800      | 350      |
| Normal years                    |              | 450                                                                                        | 600      | 600      | 450                | 600      | 200      |
| Unfavorable years               |              | 300                                                                                        | 400      | 400      | 300                | 400      | 100      |

## 185--Beowawe silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Beowawe                                                                                    | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

## 192--Vanwyper-Trunk-Trunk, steep, association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |          |
|                                 |              | Vanwyper                                                                                   | Trunk    | Trunk, steep | 1                  | 2        | 3        | 4        |
| Bluebunch wheatgrass            | AGSP         | 40-60                                                                                      | 5-10     | 5-10         | ---                | 15-30    | ---      | ---      |
| Thurber needlegrass             | STTH2        | 5-10                                                                                       | 20-50    | 20-50        | ---                | T-10     | ---      | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---          | ---                | ---      | ---      | ---      |
| Basin wildrye                   | ELC12        | 2-5                                                                                        | ---      | ---          | ---                | 2-10     | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | ---          | ---                | 15-40    | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | 2-5      | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---          | ---                | ---      | 5-10     | 5-15     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-5      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---          | ---                | 5-10     | T-10     | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-4      | 2-4          | ---                | 1-5      | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---          | ---                | 5-10     | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | 2-4          | ---                | ---      | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---          | ---                | 5-15     | 2-8      | 2-8      |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | 15-20    | 15-20        | ---                | ---      | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | T-5                                                                                        | ---      | ---          | ---                | 10-15    | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 2-5          | ---                | ---      | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | 2-5          | ---                | ---      | ---      | 2-5      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | ---          | ---                | 5-15     | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---          | ---                | ---      | 30-50    | 30-40    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---          | ---                | ---      | 15-30    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---          | ---                | ---      | 5-15     | 20-30    |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---          | ---                | ---      | 2-15     | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | 2-10         | ---                | 5-15     | ---      | ---      |
| Range site number               |              | 024X028N                                                                                   | 024X005N | 024X005N     | None               | 025X012N | 024X003N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |          |
| Favorable years                 |              | 1,000                                                                                      | 800      | 800          | ---                | 1,200    | 600      | 700      |
| Normal years                    |              | 700                                                                                        | 600      | 600          | ---                | 900      | 450      | 450      |
| Unfavorable years               |              | 500                                                                                        | 400      | 400          | ---                | 600      | 300      | 300      |



## 193--Berning-Alley association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Berning                                                                                    | Alley    | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 2-5                | 10-20    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-10               | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 2-10               | 5-15     |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 2-10               | ---      |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | 2-5                | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5                | 2-10     |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5                | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---                | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---                | 1-2      |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | 1-2                | ---      |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---      | 1-2                | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | 1-2      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 10-25              | 30-35    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | 5-15     |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 10-25              | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 2-5                | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---                | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X026N           | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | 400                | 700      |
| Normal years                    |              | 600                                                                                        | 600      | 300                | 450      |
| Unfavorable years               |              | 400                                                                                        | 400      | 200                | 300      |

## 200--Sonoma Variant silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |
|                                 |              | Sonoma Variant                                                                             | 1                  |
| Alkali bluegrass                | POJU         | 30-50                                                                                      | ---                |
| Alkali sacaton                  | SPAI         | 5-20                                                                                       | 15-30              |
| Baltic rush                     | JUBA         | 5-15                                                                                       | ---                |
| Inland saltgrass                | DIST         | 5-15                                                                                       | 5-10               |
| Arrowgrass                      | TRIGL        | 2-5                                                                                        | ---                |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 40-60              |
| Cinquefoil                      | POTEN        | 2-5                                                                                        | ---                |
| Black greasewood                | SAVE4        | ---                                                                                        | 5-15               |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | 1-2                |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-2                |
| Range site number               |              | 024X043N                                                                                   | 024X007N           |
| Potential production (lb/acre): |              |                                                                                            |                    |
| Favorable years                 |              | 3,000                                                                                      | 1,900              |
| Normal years                    |              | 2,000                                                                                      | 1,400              |
| Unfavorable years               |              | 1,000                                                                                      | 800                |

## 202--Bioya-Chiara-Cortez association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Bioya                                                                                      | Chiara   | Cortez   | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50    | 20-50              | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10     | 5-10               | ---      |
| Basin wildrye                   | ELC12        | ---                                                                                        | ---      | ---      | ---                | 50-60    |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | 5-15     |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4      | 2-4                | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4      | 2-4                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 2-8      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20    | 15-20              | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 15-20    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | ---                | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10     | 2-10               | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N | 024X005N           | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | 800      | 800                | 1,500    |
| Normal years                    |              | 600                                                                                        | 600      | 600      | 600                | 1,100    |
| Unfavorable years               |              | 400                                                                                        | 400      | 400      | 400                | 600      |

## 203--Bioya-Shabliss-Puett association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |          |
|                                 |              | Bioya                                                                                      | Shabliss | Puett    | 1                  | 2        | 3        | 4        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---      | ---                | 20-50    | ---      | 20-50    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---      | ---                | 5-10     | ---      | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 10-30    | ---                | ---      | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | ---      | 50-60    | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 10-20    | ---                | ---      | ---      | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---      | ---                | 2-4      | ---      | 2-4      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---      | ---                | 2-4      | ---      | 2-4      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 5-15     | ---                | ---      | 2-8      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 10-25    | ---                | 15-20    | ---      | 15-20    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 1-5      | ---                | 2-5      | ---      | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 1-5      | ---                | 2-5      | ---      | 2-5      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | 1-5      | ---                | ---      | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---      | ---      |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | T-5      | ---                | ---      | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 15-20    | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-4      | ---                | 2-10     | ---      | 2-10     |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 025X025N | None               | 024X005N | 024X006N | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 200      | ---                | 800      | 1,500    | 800      |
| Normal years                    |              | 600                                                                                        | 600      | 150      | ---                | 600      | 1,100    | 600      |
| Unfavorable years               |              | 400                                                                                        | 400      | 100      | ---                | 400      | 600      | 400      |

211--Blacka very fine sandy loam, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Blacka                                                                                     | 1                  | 2        | 3        | 4        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     | 10-20    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | 1-3      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | ---      | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | ---      | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | ---      | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | ---      | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 20-30    | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 2-5      | 60-70    |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---                | ---      | ---      | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X002N | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      | 500      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      | 350      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      | 200      |

212--Blacka-Broyles very fine sandy loams, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Blacka                                                                                     | Broyles  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15               | 2-10     | 5-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | 2-10     | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---                | 10-20    | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | ---      | T-10     |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---                | 1-2      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | 1-2      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40              | ---      | 30-50    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30              | ---      | 5-15     |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | 5-15     | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---                | 30-35    | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---                | ---      | 15-30    |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---                | ---      | 2-15     |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N           | 024X020N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      | 600      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      | 300      |

213--Blacka-Broyles very fine sandy loams, saline, 2 to 4 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Blacka                                                                                     | Broyles  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10     | 5-15               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 5-15               | 5-15     | 10-20    |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3                | 1-3      | ---      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10     | ---                | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50    | 30-40              | 30-40    | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30    | ---                | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15     | 20-30              | 20-30    | 2-5      |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15     | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5                | 2-5      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5                | 2-5      | 60-70    |
| Range site number               |              | 024X003N                                                                                   | 024X003N | 024X002N           | 024X002N | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 600                                                                                        | 600      | 700                | 700      | 500      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      | 350      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      | 200      |

220--Blackhawk very fine sandy loam, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Blackhawk                                                                                  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 2-5                | 5-10     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 2-5                | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---                | ---      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 2-5                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 10-20              | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | ---      | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-10               | T-10     | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 5-10               | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---                | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---                | 5-15     | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---                | ---      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 10-15              | ---      | ---      |
| Greene rabbitbrush              | CHGR6        | ---                                                                                        | 2-5                | ---      | ---      |
| Nevada ephedra                  | EPNE         | ---                                                                                        | 2-5                | ---      | ---      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | 2-5                | ---      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---                | 15-30    | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---                | ---      | 30-35    |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-10               | ---      | ---      |
| Range site number               |              | 024X002N                                                                                   | 028B009N           | 024X003N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 600      | 700      |
| Normal years                    |              | 450                                                                                        | 400                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |



230--Broyles very fine sandy loam, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Broyles                                                                                    | 1                  | 2        | 3        | 4        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-10     | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | ---      | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | ---      | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | ---      | 1-3      | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | T-10     | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-50    | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 5-15     | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | ---      | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | ---      | 2-5      | 2-5      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---                | 15-30    | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | ---      | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X003N | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 600      | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      | 300      |

231--Broyles very fine sandy loam, 2 to 4 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Broyles                                                                                    | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | ---      | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---                | ---      | 30-35    |
| Range site number               |              | O24X002N                                                                                   | O24X002N           | O24X002N | O24X020N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

232--Broyles very fine sandy loam, cemented substratum, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Broyles                                                                                    | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-10               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---                | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---                | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---                | 1-3      | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10               | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-50              | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 5-15               | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---                | 2-5      | 2-5      |
| Black greasewood                | SAVE4        | ---                                                                                        | 15-30              | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15               | ---      | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X003N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 600                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

233--Broyles very fine sandy loam, moderately saline, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Broyles                                                                                    | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10               | T-10     | T-10     |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50              | 30-50    | 30-50    |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30              | 15-30    | 15-30    |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15               | 2-15     | 2-15     |
| Range site number               |              | 024X003N                                                                                   | 024X003N           | 024X003N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 600                                                                                        | 600                | 600      | 600      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

## 235--Broyles-Creemon association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Broyles                                                                                    | Creemon  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-10               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---                | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---                | 2-5      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | 1-3      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---                | ---      | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | T-10               | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-50              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 5-15               | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---                | 2-5      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | 2-5      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | 15-30              | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | 2-15               | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---                | ---      | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X003N           | 024X002N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 600                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      | 300      |

## 237--Broyles-Beoska-Orovada association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Broyles                                                                                    | Beoska   | Orovada  | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10     | 2-10               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-10     | 2-10               | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---      | ---                | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20    | 10-20              | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2      | 1-2                | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2      | 1-2                | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2      | 1-2                | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---      | ---                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---      | ---                | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---      | ---                | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15     | 5-15               | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---      | ---                | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 30-35    | 30-35              | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X020N | 024X020N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      |

## 240--Bubus very fine sandy loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |      |
|                                 |              | Bubus                                                                                      | 1                  | 2        | 3    |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 5-10     | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---                | 10-30    | ---  |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | T-5      | ---  |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10               | ---      | ---  |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | T-5      | ---  |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50              | ---      | ---  |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30              | ---      | ---  |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15               | ---      | ---  |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15               | ---      | ---  |
| Saltbush                        | ATRIP        | ---                                                                                        | ---                | 50-65    | ---  |
| Range site number               |              | 024X003N                                                                                   | 024X003N           | 024X012N | None |
| Potential production (lb/acre): |              |                                                                                            |                    |          |      |
| Favorable years                 |              | 600                                                                                        | 600                | 700      | ---  |
| Normal years                    |              | 450                                                                                        | 450                | 400      | ---  |
| Unfavorable years               |              | 300                                                                                        | 300                | 200      | ---  |

242--Bubus very fine sandy loam, gravelly substratum

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |      |
|                                 |              | Bubus                                                                                      | 1                  | 2        | 3    |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 5-10     | ---  |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10               | T-10     | ---  |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | ---  |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50              | 30-50    | ---  |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30              | 15-30    | ---  |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15               | 5-15     | ---  |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15               | 2-15     | ---  |
| Range site number               |              | 024X003N                                                                                   | 024X003N           | 024X003N | None |
| Potential production (lb/acre): |              |                                                                                            |                    |          |      |
| Favorable years                 |              | 600                                                                                        | 600                | 600      | ---  |
| Normal years                    |              | 450                                                                                        | 450                | 450      | ---  |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | ---  |



## 243--Bubus-Playas complex

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |        |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------|--------------------|----------|
|                                 |              | Soil name                                                                                  |        | Inclusion number-- |          |
|                                 |              | Bubus                                                                                      | Playas | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---    | 5-10               | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---    | ---                | 10-30    |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---    | ---                | T-5      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---    | T-10               | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | ---    | 2-8                | T-5      |
| Shadscale                       | ATCO         | 30-50                                                                                      | ---    | 30-50              | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | ---    | 15-30              | ---      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | ---    | 5-15               | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---    | 2-15               | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---    | ---                | 50-65    |
| Range site number               |              | 024X003N                                                                                   | None   | 024X003N           | 024X012N |
| Potential production (lb/acre): |              |                                                                                            |        |                    |          |
| Favorable years                 |              | 600                                                                                        | ---    | 600                | 700      |
| Normal years                    |              | 450                                                                                        | ---    | 450                | 400      |
| Unfavorable years               |              | 300                                                                                        | ---    | 300                | 200      |

## 244--Bubus-Relley complex

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Bubus                                                                                      | Relley   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15               | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 10-20    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3                | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30              | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5                | 60-70    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N           | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 500      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 350      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 200      |

## 245--Bubus-Needle Peak-Yipor association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |             |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |             |          | Inclusion number-- |          |
|                                 |              | Bubus                                                                                      | Needle Peak | Yipor    | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---         | 5-10     | 5-10               | 5-10     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 50-60       | ---      | ---                | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | 5-15        | ---      | ---                | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---         | 10-30    | ---                | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---         | T-5      | ---                | ---      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---         | ---      | T-10               | T-10     |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8         | T-5      | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | ---         | ---      | 30-50              | 30-50    |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 2-10        | ---      | 15-30              | 15-30    |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | ---         | ---      | 5-15               | 5-15     |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---         | ---      | 2-15               | 2-15     |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 15-20       | ---      | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 2-5         | ---      | ---                | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---         | 50-65    | ---                | ---      |
| Range site number               |              | 024X003N                                                                                   | 024X006N    | 024X012N | 024X003N           | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |             |          |                    |          |
| Favorable years                 |              | 600                                                                                        | 1,500       | 700      | 600                | 600      |
| Normal years                    |              | 450                                                                                        | 1,100       | 400      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 600         | 200      | 300                | 300      |

## 247--Bubus-Isolde association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Bubus                                                                                      | Isolde   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---      | 5-10               | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 10-20    | ---                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 5-10     | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | 5-15     | 40-60    |
| Inland saltgrass                | DIST         | ---                                                                                        | ---      | ---                | 5-10     | 5-10     |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---      | ---                | ---      | 15-30    |
| Other perennial grasses         | PPGG         | T-10                                                                                       | 2-5      | T-10               | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-5      | 2-8                | T-5      | ---      |
| Shadscale                       | ATCO         | 30-50                                                                                      | ---      | 30-50              | ---      | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 10-40    | 15-30              | 60-75    | 5-15     |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | ---      | 5-15               | ---      | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---      | 2-15               | ---      | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-20     | ---                | ---      | ---      |
| Range site number               |              | 024X003N                                                                                   | 027X016N | 024X003N           | 024X011N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 600                                                                                        | 300      | 600                | 500      | 1,900    |
| Normal years                    |              | 450                                                                                        | 200      | 450                | 350      | 1,400    |
| Unfavorable years               |              | 300                                                                                        | 50       | 300                | 200      | 800      |

## 248--Bubus-Batan-Reese association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Bubus                                                                                      | Batan    | Reese    | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10     | ---      | 5-10               | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 5-15     | ---                | 50-60    |
| Inland saltgrass                | DIST         | ---                                                                                        | ---      | 5-10     | ---                | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | 5-15     |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10     | ---      | T-10               | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | T-5      | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50    | ---      | 30-50              | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30    | 60-75    | 15-30              | 2-10     |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15     | ---      | 5-15               | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15     | ---      | 2-15               | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 15-20    |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Range site number               |              | 024X003N                                                                                   | 024X003N | 024X011N | 024X003N           | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 600                                                                                        | 600      | 500      | 600                | 1,500    |
| Normal years                    |              | 450                                                                                        | 450      | 350      | 450                | 1,100    |
| Unfavorable years               |              | 300                                                                                        | 300      | 200      | 300                | 600      |

## 251--Bucan-Bucan, steep, association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|--------------------|------|
|                                 |              | Soil name                                                                                  |              | Inclusion number-- |      |
|                                 |              | Bucan                                                                                      | Bucan, steep | 1                  | 2    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 5-10         | 20-50              | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 40-60        | 5-10               | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10         | ---                | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-5          | ---                | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---          | 2-4                | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-5          | 2-4                | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5          | ---                | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 5-10         | 15-20              | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---          | 2-5                | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---          | 2-5                | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | T-5          | ---                | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---          | 2-10               | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X028N     | 024X005N           | None |
| Potential production (lb/acre): |              |                                                                                            |              |                    |      |
| Favorable years                 |              | 800                                                                                        | 1,000        | 800                | ---  |
| Normal years                    |              | 600                                                                                        | 700          | 600                | ---  |
| Unfavorable years               |              | 400                                                                                        | 500          | 400                | ---  |

## 252--Bucan-Humdun-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |
|                                 |              | Bucan                                                                                      | Humdun   | Rock outcrop | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---          | 20-50              | 15-25    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---          | 5-10               | 20-30    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---          | ---                | 10-15    |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---          | 2-4                | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---          | 2-4                | 2-5      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---          | ---                | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---          | ---                | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---          | 15-20              | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---          | 2-5                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---          | 2-5                | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---          | ---                | 10-15    |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---          | 2-10               | 5-10     |
| Range site number               |              | 024X005N                                                                                   | 024X005N | None         | 024X005N           | 025X014N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | ---          | 800                | 1,000    |
| Normal years                    |              | 600                                                                                        | 600      | ---          | 600                | 800      |
| Unfavorable years               |              | 400                                                                                        | 400      | ---          | 400                | 600      |

## 262--Chen-Slaven-Chen, cobbly, association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |      |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |      |          |          |
|                                 |              | Chen                                                                                       | Slaven   | Chen, cobbly | 1                  | 2    | 3        | 4        |
| Idaho fescue                    | FEID         | 25-50                                                                                      | ---      | 25-50        | ---                | ---  | ---      | 5-15     |
| Bluebunch wheatgrass            | AGSP         | 15-30                                                                                      | 20-30    | 15-30        | ---                | ---  | ---      | 5-10     |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | 15-25    | 2-10         | ---                | ---  | ---      | ---      |
| Spike fescue                    | HEKI         | 2-10                                                                                       | ---      | 2-10         | ---                | ---  | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 2-10     | ---          | 5-15               | ---  | 5-10     | 2-5      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---          | 50-60              | ---  | ---      | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---          | 2-10               | ---  | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---          | 1-5                | ---  | 5-10     | ---      |
| Tufted hairgrass                | DECA5        | ---                                                                                        | ---      | ---          | ---                | ---  | 30-60    | ---      |
| Alpine timothy                  | PHAL2        | ---                                                                                        | ---      | ---          | ---                | ---  | 5-10     | ---      |
| Meadow barley                   | HOB2         | ---                                                                                        | ---      | ---          | ---                | ---  | 2-5      | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 10-15    |
| Slender wheatgrass              | AGTR         | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 10-15    |
| Bearded wheatgrass              | AGSU         | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 10-15    |
| Bulbous oniongrass              | MEBU         | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 2-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-15    | ---          | 15-20              | ---  | 2-10     | ---      |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | 2-5          | ---                | ---  | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | ---          | ---                | ---  | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | ---          | ---                | ---  | ---      | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | ---      | ---          | ---                | ---  | 2-5      | ---      |
| Cinquefoil                      | POTEN        | ---                                                                                        | ---      | ---          | ---                | ---  | 2-5      | ---      |
| Geranium                        | GERAN        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 2-5      |
| Groundsel                       | SENEC        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 2-5      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-5      | ---          | 5-10               | ---  | 10-20    | ---      |
| Low sagebrush                   | ARAR8        | 10-20                                                                                      | ---      | 10-20        | ---                | ---  | ---      | ---      |
| Douglas rabbitbrush             | CHVI8        | 2-5                                                                                        | ---      | 2-5          | ---                | ---  | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | 10-15    | ---          | ---                | ---  | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---          | 10-15              | ---  | ---      | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---      | ---          | ---                | ---  | 2-5      | ---      |
| Serviceberry                    | AMELA        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 5-10     |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 5-10     |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 2-10     |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-10     | ---          | 2-5                | ---  | 2-5      | ---      |
| Range site number               |              | 024X027N                                                                                   | 025X014N | 024X027N     | 025X003N           | None | 025X005N | 024X032N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |      |          |          |
| Favorable years                 |              | 1,200                                                                                      | 1,000    | 1,200        | 2,500              | ---  | 2,000    | 2,200    |
| Normal years                    |              | 800                                                                                        | 800      | 800          | 1,900              | ---  | 1,700    | 1,700    |
| Unfavorable years               |              | 600                                                                                        | 600      | 600          | 1,200              | ---  | 1,000    | 1,200    |



## 272--Cherry Spring-Enko association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Cherry Spring                                                                              | Enko     | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50              | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10               | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | 50-60    |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---                | 5-15     |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4                | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---                | 2-8      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20              | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | 15-20    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---                | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---                | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10               | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N           | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | 800                | 1,500    |
| Normal years                    |              | 600                                                                                        | 600      | 600                | 1,100    |
| Unfavorable years               |              | 400                                                                                        | 400      | 400                | 600      |

## 282--Chiara-Orovada association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Chiara                                                                                     | Orovada  | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50              | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10               | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---                | 20-40    |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---                | 5-15     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | 2-10     |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | ---      | ---                | 2-10     |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4                | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4                | ---      |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | ---      | ---                | 2-5      |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | ---      | ---                | 2-4      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20              | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | 5-10     |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | 10-20    |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---                | 2-10     |
| Hairy horsebrush                | TECO2        | ---                                                                                        | ---      | ---                | 5-8      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---                | 2-8      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---                | 1-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10               | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N           | 024X001N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | 800                | 800      |
| Normal years                    |              | 600                                                                                        | 600      | 600                | 500      |
| Unfavorable years               |              | 400                                                                                        | 400      | 400                | 300      |

## 283--Chiara-Tenabo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Chiara                                                                                     | Tenabo   | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---      | ---                | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15     | ---                | 2-5      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15     | ---                | 2-5      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | ---                | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | ---                | 2-5      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 30-50              | 10-20    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 2-5                | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | 2-5                | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 15-25              | 5-10     |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---                | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | ---                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | 2-5                | 5-10     |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | ---                | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | ---                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---                | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | ---                | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | ---                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 5-10               | 10-15    |
| Greene rabbitbrush              | CHGR6        | ---                                                                                        | ---      | ---                | 2-5      |
| Nevada ephedra                  | EPNE         | ---                                                                                        | ---      | ---                | 2-5      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---                | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | 5-10               | 5-10     |
| Range site number               |              | 024X005N                                                                                   | 024X002N | 028B003N           | 028B009N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 700      | 2,600              | 700      |
| Normal years                    |              | 600                                                                                        | 450      | 1,250              | 400      |
| Unfavorable years               |              | 400                                                                                        | 300      | 800                | 300      |

## 284--Chiara-Dewar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Chiara                                                                                     | Dewar    | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 20-30                                                                                      | 20-30    | 20-30              | 20-30    | 5-15     |
| Needleandthread                 | STCO4        | 10-20                                                                                      | 10-20    | 10-20              | 10-20    | 5-10     |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10     | 5-10               | 5-10     | 2-5      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | ---      | 5-10     |
| Perennial forbs                 | PPFF         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | 5-10     |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20              | 15-20    | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---                | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---                | ---      | 5-10     |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---                | ---      | 2-5      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     | 5-15     |
| Range site number               |              | 028B010N                                                                                   | 028B010N | 028B010N           | 028B010N | 028B017N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 800                | 800      | 700      |
| Normal years                    |              | 600                                                                                        | 600      | 600                | 600      | 500      |
| Unfavorable years               |              | 400                                                                                        | 400      | 400                | 400      | 250      |

## 285--Chiara-Trunk-Midraw association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |               |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|---------------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |               |
|                                 |              | Chiara                                                                                     | Trunk    | Midraw   | 1                  | 2        | 3             |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 5-10     | 2-10               | ---      | 15-25         |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 40-60    | 20-30              | ---      | 20-30         |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 2-10     | ---                | ---      | ---           |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 2-5      | 2-15               | 50-60    | ---           |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | ---      | 20-40              | ---      | ---           |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | 5-15     | 2-10          |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---           |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | 1-5      | ---           |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | 15-20    | 10-15         |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---      | ---                | ---      | ---           |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-5      | 1-5                | ---      | 2-5           |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 2-5      | 1-5                | ---      | 2-5           |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 5-10     | 2-5           |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 5-10     | ---                | ---      | ---           |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---      | ---                | ---      | ---           |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---      | ---                | ---      | ---           |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | ---      | ---                | ---      | ---           |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | T-5      | 5-15               | ---      | ---           |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | ---                | 10-15    | ---           |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---      | ---                | 2-5      | 10-15<br>5-10 |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X028N | 024X021N           | 025X003N | 025X014N      |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |               |
| Favorable years                 |              | 800                                                                                        | 800      | 1,000    | 1,400              | 2,500    | 1,000         |
| Normal years                    |              | 600                                                                                        | 600      | 700      | 1,000              | 1,900    | 800           |
| Unfavorable years               |              | 400                                                                                        | 400      | 500      | 700                | 1,200    | 600           |

## 286--Chiara-Jenor association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Chiara                                                                                     | Jenor    | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---      | 10-20              | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15     | 2-10               | 2-5      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15     | 5-15               | 2-5      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | 2-10               | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | ---                | 2-5      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | 5-10     |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---                | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | 1-2                | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | ---                | 5-10     |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 30-35              | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | ---                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | ---                | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | ---                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | 10-15    |
| Greene rabbitbrush              | CHGR6        | ---                                                                                        | ---      | ---                | 2-5      |
| Nevada ephedra                  | EPNE         | ---                                                                                        | ---      | ---                | 2-5      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---                | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---                | 5-10     |
| Range site number               |              | 024X005N                                                                                   | 024X002N | 024X020N           | 028B009N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 700      | 700                | 700      |
| Normal years                    |              | 600                                                                                        | 450      | 450                | 400      |
| Unfavorable years               |              | 400                                                                                        | 300      | 300                | 300      |

290--Creemon silt loam, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Creemon                                                                                    | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 10-20    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3                | 1-3      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 60-70    |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 500      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 350      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 200      |

291--Creemon silt loam, 2 to 4 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Creemon                                                                                    | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 10-20    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 60-70    |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 500      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 350      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 200      |



292--Creemon silt loam, 0 to 2 percent slopes, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Creemon                                                                                    | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 10-20    |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-15               | 5-15     | 2-10     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | 1-3      | ---      |
| Globemallow                     | SPHAE        | 1-4                                                                                        | ---                | ---      | ---      |
| Phlox                           | PHLOX        | 1-4                                                                                        | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8                | 2-8      | 2-8      |
| Winterfat                       | EULA5        | 20-40                                                                                      | 2-5                | 2-5      | 60-70    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 2-5      |
| Shadscale                       | ATCO         | 2-5                                                                                        | 30-40              | 30-40    | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5                | 2-5      | ---      |
| Range site number               |              | O24X014N                                                                                   | O24X002N           | O24X002N | O24X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 400                                                                                        | 700                | 700      | 500      |
| Normal years                    |              | 300                                                                                        | 450                | 450      | 350      |
| Unfavorable years               |              | 200                                                                                        | 300                | 300      | 200      |

293--Creemon silt loam, strongly saline, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Creemon                                                                                    | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-15               | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15               | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | ---      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---                | T-10     |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-40              | 30-50    |
| Black greasewood                | SAVE4        | 15-30                                                                                      | ---                | 15-30    |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 20-30              | 5-15     |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---                | 2-15     |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | ---      |
| Range site number               |              | 024X003N                                                                                   | 024X002N           | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 600                                                                                        | 700                | 600      |
| Normal years                    |              | 450                                                                                        | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      |

## 294--Creemon-Orovada-Broyles association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Creemon                                                                                    | Orovada  | Broyles  | 1                  | 2        |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 2-10     | 2-10     | 2-10               | 2-10     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-10     | 2-5      | 2-10               | 2-10     |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 10-20    | ---      | 10-20              | 10-20    |
| Globemallow                     | SPHAE        | 1-4                                                                                        | 1-2      | 1-4      | 1-2                | 1-2      |
| Phlox                           | PHLOX        | 1-4                                                                                        | 1-2      | 1-4      | 1-2                | 1-2      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-2      | ---      | 1-2                | 1-2      |
| Winterfat                       | EULA5        | 20-40                                                                                      | ---      | 20-40    | ---                | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | 20-30    | ---                | ---      |
| Shadscale                       | ATCO         | 2-5                                                                                        | ---      | 2-5      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 30-35    | ---      | 30-35              | 30-35    |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 5-15     | ---      | 5-15               | 5-15     |
| Range site number               |              | 024X014N                                                                                   | 024X020N | 024X014N | 024X020N           | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 400                                                                                        | 700      | 400      | 700                | 700      |
| Normal years                    |              | 300                                                                                        | 450      | 300      | 450                | 450      |
| Unfavorable years               |              | 200                                                                                        | 300      | 200      | 300                | 300      |

## 295--Creemon-Cren association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Creemon                                                                                    | Cren     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | ---                | 5-10     | 2-5      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---                | ---      | 2-10     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---                | ---      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 50-60              | ---      | 10-20    |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | 5-15               | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | T-10     | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                | 5-15     | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---                | ---      | 15-30    |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 15-20              | ---      | 15-25    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | 2-10               | 15-30    | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | 2-5                | ---      | 2-5      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---                | 2-15     | ---      |
| Anderson peachbrush             | PRAN2        | ---                                                                                        | ---      | ---                | ---      | 2-10     |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X006N           | 024X003N | 024X041N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 1,500              | 600      | 1,000    |
| Normal years                    |              | 450                                                                                        | 450      | 1,100              | 450      | 800      |
| Unfavorable years               |              | 300                                                                                        | 300      | 600                | 300      | 600      |

## 296--Creemon-Hessing association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Creemon                                                                                    | Hessing  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10               | 2-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-10               | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20              | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                | 1-4      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                | 1-4      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                | 2-5      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | ---      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | 20-40    | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 30-35              | ---      | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X020N           | 024X014N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 400      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 300      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 200      | 300      |

## 297--Creemon-Orovada-Tulase association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Creemon                                                                                    | Orovada  | Tulase   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | ---      | 5-10               | 2-5      | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | ---      | ---                | 2-10     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | ---      | ---                | 2-5      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | 20-50    | ---                | ---      | 10-20    |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | 5-10     | ---                | ---      | ---      |
| Basin wildrye                   | ELC12        | ---                                                                                        | ---      | ---      | ---                | 10-20    | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | T-10               | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | 2-4      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | 2-4      | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | ---      | 2-8                | ---      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | ---      | 30-50              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | ---      | 5-15               | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | ---                | 15-30    | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | 15-20    | ---                | ---      | 30-35    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 2-5      | ---                | ---      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | 15-30              | 2-10     | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---      | 2-15               | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 15-25    | ---      |
| Anderson peachbrush             | PRAN2        | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | 2-10     | ---                | ---      | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X005N | 024X005N | 024X003N           | 024X041N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 800      | 800      | 600                | 1,000    | 700      |
| Normal years                    |              | 450                                                                                        | 600      | 600      | 450                | 800      | 450      |
| Unfavorable years               |              | 300                                                                                        | 400      | 400      | 300                | 600      | 300      |

## 298--Creemon-Misad association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |          |
|                                 |              | Creemon                                                                                    | Misad    | 1                  | 2        | 3        | 4        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-10     | 2-10     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | ---      | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | ---      | 2-10     | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3                | ---      | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---                | ---      | 10-20    | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | T-10     | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---                | ---      | 1-2      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | ---      | 1-2      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | ---      | 1-2      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      | ---      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40              | 30-50    | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30              | 5-15     | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | ---      | 5-15     | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5                | ---      | ---      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---                | 15-30    | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---                | 2-15     | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---                | ---      | 30-35    | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N           | 024X003N | 024X020N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 600      | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      | 300      | 300      |

## 300--Cren silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Cren                                                                                       | 1                  | 2        | 3        | 4        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | 1-3      | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 2-5      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      | 300      |



## 303--Cren-Doowak-Relley association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Cren                                                                                       | Doowak   | Relley   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 2-10     | 5-15     | 5-15               | ---      | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | ---      | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-10     | 2-5      | 2-5                | ---      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | 1-3      | 1-3                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 10-20    | ---      | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | 50-60    | 50-60    |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | 5-15     | 5-15     |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-2      | ---      | ---                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | 1-2      | ---      | ---                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 1-2      | ---      | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | 2-8      | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | 30-40    | 30-40              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | 20-30    | 20-30              | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-15     | 2-5      | 2-5                | ---      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | 2-5      | 2-5                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 30-35    | ---      | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 15-20    | 15-20    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | ---                | 2-10     | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | 2-5      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X020N | 024X002N | 024X002N           | 024X006N | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 1,500    | 1,500    |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 1,100    | 1,100    |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 600      | 600      |

## 304--Cren-Raglan-Batan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |
|                                 |              | Cren                                                                                       | Raglan   | Batan    | 1                  |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-10     | 5-15               |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---      | 5-15               |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---      | 2-5                |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---      | 1-3                |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | T-10     | ---                |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | 2-8                |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-50    | 30-40              |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 5-15     | 20-30              |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---      | 2-5                |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---      | 2-5                |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | 15-30    | ---                |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | 2-15     | ---                |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X003N | 024X002N           |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |
| Favorable years                 |              | 700                                                                                        | 700      | 600      | 700                |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                |

## 310--Davey fine sandy loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Davey                                                                                      | 1                  | 2        |
| Needleandthread                 | STCO4        | 20-30                                                                                      | 5-15               | ---      |
| Indian ricegrass                | ORHY         | 10-20                                                                                      | 20-40              | 5-15     |
| Thickspike wheatgrass           | AGDA         | 2-10                                                                                       | 2-10               | ---      |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---                | 2-10     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-10               | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | 10-20    |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---                | 2-10     |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | 2-5                | ---      |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | 2-4                | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | 1-2      |
| Other perennial forbs           | PPFF         | 10-20                                                                                      | ---                | ---      |
| Basin big sagebrush             | ARTRT*       | 5-15                                                                                       | 10-20              | ---      |
| Wyoming big sagebrush           | ARTRW*       | T-5                                                                                        | ---                | 30-35    |
| Spiny hopsage                   | GRSP         | T-5                                                                                        | 5-10               | 5-15     |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | 2-10               | ---      |
| Hairy horsebrush                | TECO2        | ---                                                                                        | 5-8                | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | 2-8                | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-5                | ---      |
| Range site number               |              | 024X017N                                                                                   | 024X001N           | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 900                                                                                        | 800                | 700      |
| Normal years                    |              | 700                                                                                        | 500                | 450      |
| Unfavorable years               |              | 500                                                                                        | 300                | 300      |

## 312--Davey fine sandy loam, cemented substratum

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Davey                                                                                      | 1                  | 2        | 3        |
| Needleandthread                 | STCO4        | 20-30                                                                                      | 1-3                | 5-15     | ---      |
| Indian ricegrass                | ORHY         | 10-20                                                                                      | 5-15               | 20-40    | 5-15     |
| Thickspike wheatgrass           | AGDA         | 2-10                                                                                       | ---                | 2-10     | ---      |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | 5-15               | ---      | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | ---      | 2-10     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---                | 2-10     | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | ---      | 10-20    |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | ---                | 2-5      | ---      |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 10-20                                                                                      | 2-8                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | 5-15                                                                                       | ---                | 10-20    | ---      |
| Wyoming big sagebrush           | ARTRW*       | T-5                                                                                        | ---                | ---      | 30-35    |
| Spiny hopsage                   | GRSP         | T-5                                                                                        | 2-5                | 5-10     | 5-15     |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30              | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | ---      | ---      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---                | 2-10     | ---      |
| Hairy horsebrush                | TECO2        | ---                                                                                        | ---                | 5-8      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---                | 2-8      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---                | 1-5      | ---      |
| Range site number               |              | O24X017N                                                                                   | O24X002N           | O24X001N | O24X020N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 900                                                                                        | 700                | 800      | 700      |
| Normal years                    |              | 700                                                                                        | 450                | 500      | 450      |
| Unfavorable years               |              | 500                                                                                        | 300                | 300      | 300      |

## 313--Davey-Goldrun complex

[Absence of an entry indicates that the named plant is not key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |
|                                 |              | Davey                                                                                      | Goldrun  | 1                  |
| Needleandthread                 | STC04        | 20-30                                                                                      | 5-15     | ---                |
| Indian ricegrass                | ORHY         | 10-20                                                                                      | 20-40    | 5-15               |
| Thickspike wheatgrass           | AGDA         | 2-10                                                                                       | 2-10     | ---                |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | 2-10               |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-10     | ---                |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20              |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-10               |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | 2-5      | ---                |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | 2-4      | ---                |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2                |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                |
| Other perennial forbs           | PPFF         | 10-20                                                                                      | ---      | ---                |
| Basin big sagebrush             | ARTRT*       | 5-15                                                                                       | 10-20    | ---                |
| Wyoming big sagebrush           | ARTRW*       | T-5                                                                                        | ---      | 30-35              |
| Spiny hopsage                   | GRSP         | T-5                                                                                        | 5-10     | 5-15               |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | 2-10     | ---                |
| Hairy horsebrush                | TECO2        | ---                                                                                        | 5-8      | ---                |
| Black greasewood                | SAVE4        | ---                                                                                        | 2-8      | ---                |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-5      | ---                |
| Range site number               |              | 024X017N                                                                                   | 024X001N | 024X020N           |
| Potential production (lb/acre): |              |                                                                                            |          |                    |
| Favorable years                 |              | 900                                                                                        | 800      | 700                |
| Normal years                    |              | 700                                                                                        | 500      | 450                |
| Unfavorable years               |              | 500                                                                                        | 300      | 300                |

## 340--Duffer very fine sandy loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Duffer                                                                                     | 1                  | 2        | 3        | 4        |
| Alkali sacaton                  | SPAI         | 40-70                                                                                      | 15-30              | ---      | ---      | ---      |
| Inland saltgrass                | DIST         | T-15                                                                                       | 5-10               | 5-10     | ---      | 5-10     |
| Basin wildrye                   | ELCI2        | T-5                                                                                        | 40-60              | 5-15     | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | ---      | 5-10     | ---      |
| Wildrye                         | ELMYU        | ---                                                                                        | ---                | ---      | ---      | 30-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---                | ---      | ---      | 5-10     |
| Mat muhly                       | MURI         | ---                                                                                        | ---                | ---      | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | ---      | T-10     | 5-15     |
| Sierra clover                   | TRWO         | ---                                                                                        | ---                | ---      | ---      | 2-5      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---                | T-5      | 2-8      | 5-10     |
| Iodinebush                      | ALOC2        | 10-20                                                                                      | ---                | ---      | ---      | ---      |
| Saltbush                        | ATRIP        | 5-10                                                                                       | ---                | ---      | ---      | ---      |
| Black greasewood                | SAVE4        | 2-5                                                                                        | 5-15               | 60-75    | 15-30    | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | ---      | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | ---      | 5-15     | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | ---      | 2-15     | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | 1-2                | ---      | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-2                | ---      | ---      | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---                | ---      | ---      | 5-10     |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | ---      | ---      | 2-5      |
| Silver sagebrush                | ARCA13       | ---                                                                                        | ---                | ---      | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---                | ---      | ---      | 2-8      |
| Range site number               |              | 024X010N                                                                                   | 024X007N           | 024X011N | 024X003N | 025X001N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 450                                                                                        | 1,900              | 500      | 600      | 3,000    |
| Normal years                    |              | 300                                                                                        | 1,400              | 350      | 450      | 2,500    |
| Unfavorable years               |              | 150                                                                                        | 800                | 200      | 300      | 1,800    |

## 370--Enko fine sandy loam, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |
|                                 |              | Enko                                                                                       | 1                  |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---                |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---                |
| Indian ricegrass                | ORHY         | ---                                                                                        | 20-40              |
| Needleandthread                 | STCO4        | ---                                                                                        | 5-15               |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-10               |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | 2-10               |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---                |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---                |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | 2-5                |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | 2-4                |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---                |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---                |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-10               |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 10-20              |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | 2-10               |
| Hairy horsebrush                | TECO2        | ---                                                                                        | 5-8                |
| Black greasewood                | SAVE4        | ---                                                                                        | 2-8                |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-5                |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---                |
| Range site number               |              | 024X005N                                                                                   | 024X001N           |
| Potential production (lb/acre): |              |                                                                                            |                    |
| Favorable years                 |              | 800                                                                                        | 800                |
| Normal years                    |              | 600                                                                                        | 500                |
| Unfavorable years               |              | 400                                                                                        | 300                |

## 371--Enko-Shabliss-Orovada association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |
|                                 |              | Enko                                                                                       | Shabliss | Orovada  |                    |
|                                 |              |                                                                                            |          |          | 1                  |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 10-20    | ---                |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---      | ---                |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 5-15     | 20-40              |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-10     | ---                |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-10     | ---                |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | 5-15               |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | 2-10               |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | ---      | ---      | 2-10               |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---      | ---                |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 1-2      | ---                |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2      | ---                |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2      | ---                |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | ---      | ---      | 2-5                |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | ---      | ---      | 2-4                |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 30-35    | ---                |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---      | ---                |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15     | 5-10               |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | 10-20              |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---      | 2-10               |
| Hairy horsebrush                | TECO2        | ---                                                                                        | ---      | ---      | 5-8                |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | 2-8                |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | 1-5                |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---      | ---                |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X020N | 024X001N           |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |
| Favorable years                 |              | 800                                                                                        | 800      | 700      | 800                |
| Normal years                    |              | 600                                                                                        | 600      | 450      | 500                |
| Unfavorable years               |              | 400                                                                                        | 400      | 300      | 300                |



## 400--Glean-Walti-Cleavage association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |      |
|                                 |              | Glean                                                                                      | Walti    | Cleavage | 1                  | 2    | 3        | 4    |
| Idaho fescue                    | FEID         | 30-60                                                                                      | 25-50    | 10-20    | 1-10               | ---  | 5-15     | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 15-30    | ---      | 20-50              | ---  | 5-15     | ---  |
| Cusick bluegrass                | POCU3        | 5-10                                                                                       | ---      | 2-5      | ---                | ---  | 2-5      | ---  |
| Mountain brome                  | BRMA4        | 2-5                                                                                        | ---      | ---      | 2-15               | ---  | 5-10     | ---  |
| Sedge                           | CAREX        | 2-5                                                                                        | ---      | ---      | ---                | ---  | ---      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 2-10     | ---      | 2-5                | ---  | ---      | ---  |
| Spike fescue                    | HEKI         | ---                                                                                        | 2-10     | ---      | ---                | ---  | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10     | ---                | ---  | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10     | 2-5                | ---  | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | 5-10               | ---  | 2-5      | ---  |
| Slender wheatgrass              | AGTR         | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---  |
| Bearded wheatgrass              | AGSU         | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---  |
| Letterman needlegrass           | STLE4        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---  |
| Tapertip hawksbeard             | CRAC2        | 1-3                                                                                        | ---      | ---      | 2-5                | ---  | ---      | ---  |
| Lupine                          | LUPIN        | 1-2                                                                                        | ---      | ---      | ---                | ---  | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---      | 2-5                | ---  | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | ---  | 5-15     | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | ---      | ---      | 5-15               | ---  | 5-10     | ---  |
| Snowberry                       | SYMPH        | 2-5                                                                                        | ---      | ---      | ---                | ---  | 2-10     | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 10-20    | 5-15     | ---                | ---  | ---      | ---  |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | ---  | ---      | ---  |
| Serviceberry                    | AMELA        | ---                                                                                        | ---      | ---      | ---                | ---  | 5-10     | ---  |
| Oceanspray                      | HOLOD        | ---                                                                                        | ---      | ---      | ---                | ---  | 5-10     | ---  |
| Threetip sagebrush              | ARTR4        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-10     | ---  |
| Currant                         | RIBES        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---  |
| Range site number               |              | 024X023N                                                                                   | 024X027N | 024X016N | 024X029N           | None | 024X034N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |      |
| Favorable years                 |              | 1,500                                                                                      | 1,200    | 350      | 1,500              | ---  | 1,600    | ---  |
| Normal years                    |              | 1,200                                                                                      | 800      | 250      | 1,100              | ---  | 1,300    | ---  |
| Unfavorable years               |              | 900                                                                                        | 600      | 150      | 800                | ---  | 800      | ---  |

## 411--Golconda-Blackhawk association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |           | Inclusion number-- |          |
|                                 |              | Golconda                                                                                   | Blackhawk | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15      | 5-15               | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15      | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5       | 2-5                | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3       | 1-3                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---       | ---                | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---       | ---                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---       | ---                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---       | ---                | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8       | 2-8                | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40     | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30     | 20-30              | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5       | 2-5                | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5       | 2-5                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---       | ---                | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N  | 024X002N           | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |           |                    |          |
| Favorable years                 |              | 700                                                                                        | 700       | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450       | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300       | 300                | 300      |

## 412--Golconda-Dun Glen association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Golconda                                                                                   | Dun Glen | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3                | 1-3      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---                | ---      | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30              | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---                | ---      | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N           | 024X002N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      | 300      |

## 413--Golconda-Blownout land complex

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |               |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|---------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |               | Inclusion number-- |          |          |
|                                 |              | Golconda                                                                                   | Blownout land | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---           | 2-10               | 5-15     | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---           | 5-15               | 5-15     | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---           | 2-10               | 2-5      | ---      |
| Needleandthread                 | STC04        | 1-3                                                                                        | ---           | ---                | 1-3      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---           | 10-20              | ---      | 20-50    |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---           | ---                | ---      | 5-10     |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---           | 1-2                | ---      | 2-4      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---           | 1-2                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---           | 1-2                | ---      | ---      |
| balsamroot                      | BALSA        | ---                                                                                        | ---           | ---                | ---      | 2-4      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---           | ---                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---           | ---                | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---           | ---                | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---           | 5-15               | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---           | ---                | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---           | 30-35              | ---      | 15-20    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---           | ---                | ---      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | None          | 024X020N           | 024X002N | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |               |                    |          |          |
| Favorable years                 |              | 700                                                                                        | ---           | 700                | 700      | 800      |
| Normal years                    |              | 450                                                                                        | ---           | 450                | 450      | 600      |
| Unfavorable years               |              | 300                                                                                        | ---           | 300                | 300      | 400      |

## 420--Goldrun fine sand, 0 to 4 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Goldrun                                                                                    | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 20-40                                                                                      | 10-20              | 5-15     | 5-15     |
| Needleandthread                 | STCO4        | 5-15                                                                                       | 20-30              | 1-3      | ---      |
| Basin wildrye                   | ELCI2        | 2-10                                                                                       | ---                | ---      | ---      |
| Thickspike wheatgrass           | AGDA         | 2-10                                                                                       | 2-10               | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-5                | 5-15     | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---                | 2-5      | 2-10     |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | ---      | 10-20    |
| Lemon scurfpea                  | PSLA         | 2-5                                                                                        | ---                | ---      | ---      |
| Tufted eveningprimrose          | OECA         | 2-4                                                                                        | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 10-20              | 2-8      | ---      |
| Basin big sagebrush             | ARTRT*       | 10-20                                                                                      | 5-15               | ---      | ---      |
| Spiny hopsage                   | GRSP         | 5-10                                                                                       | T-5                | 2-5      | 5-15     |
| Fourwing saltbush               | ATCA2        | 2-10                                                                                       | ---                | ---      | ---      |
| Hairy horsebrush                | TECO2        | 5-8                                                                                        | ---                | ---      | ---      |
| Black greasewood                | SAVE4        | 2-8                                                                                        | ---                | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-5                                                                                        | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | T-5                | ---      | 30-35    |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | 20-30    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---                | 2-5      | ---      |
| Range site number               |              | 024X001N                                                                                   | 024X017N           | 024X002N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 900                | 700      | 700      |
| Normal years                    |              | 500                                                                                        | 700                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 500                | 300      | 300      |

## 422--Goldrun-Old Camp association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Goldrun                                                                                    | Old Camp | 1                  | 2        |
| Indian ricegrass                | ORHY         | 20-40                                                                                      | ---      | ---                | 5-15     |
| Needleandthread                 | STCO4        | 5-15                                                                                       | ---      | ---                | ---      |
| Basin wildrye                   | ELCI2        | 2-10                                                                                       | ---      | ---                | ---      |
| Thickspike wheatgrass           | AGDA         | 2-10                                                                                       | ---      | ---                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | ---                | 10-20    |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---                | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---                | 2-10     |
| Lemon scurfpea                  | PSLA         | 2-5                                                                                        | ---      | ---                | ---      |
| Tufted eveningprimrose          | OECA         | 2-4                                                                                        | ---      | ---                | ---      |
| balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---                | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | 1-2      |
| Basin big sagebrush             | ARTRT*       | 10-20                                                                                      | ---      | ---                | ---      |
| Spiny hopsage                   | GRSP         | 5-10                                                                                       | 2-5      | ---                | 5-15     |
| Fourwing saltbush               | ATCA2        | 2-10                                                                                       | ---      | ---                | ---      |
| Hairy horsebrush                | TECO2        | 5-8                                                                                        | ---      | ---                | ---      |
| Black greasewood                | SAVE4        | 2-8                                                                                        | ---      | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-5                                                                                        | ---      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---                | 30-35    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---                | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---                | ---      |
| Range site number               |              | 024X001N                                                                                   | 024X005N | None               | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | ---                | 700      |
| Normal years                    |              | 500                                                                                        | 600      | ---                | 450      |
| Unfavorable years               |              | 300                                                                                        | 400      | ---                | 300      |

## 441--Gund-Umberland association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |           | Inclusion number-- |          |      |
|                                 |              | Gund                                                                                       | Umberland | 1                  | 2        | 3    |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | ---       | 15-20              | 40-60    | ---  |
| Western wheatgrass              | AGSM         | 5-15                                                                                       | ---       | ---                | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-10      | 2-10               | ---      | ---  |
| Inland saltgrass                | DIST         | ---                                                                                        | ---       | 2-10               | 5-10     | ---  |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---       | ---                | 15-30    | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10      | ---                | ---      | ---  |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8       | 2-8                | ---      | ---  |
| Basin big sagebrush             | ARTRT*       | 15-20                                                                                      | ---       | ---                | ---      | ---  |
| Black greasewood                | SAVE4        | 2-10                                                                                       | 15-30     | 40-60              | 5-15     | ---  |
| Rubber rabbitbrush              | CHNA2        | 2-5                                                                                        | ---       | ---                | 1-2      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | 30-50     | ---                | ---      | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 5-15      | ---                | ---      | ---  |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15      | ---                | ---      | ---  |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---       | ---                | 1-2      | ---  |
| Range site number               |              | 024X006N                                                                                   | 024X003N  | 024X008N           | 024X007N | None |
| Potential production (lb/acre): |              |                                                                                            |           |                    |          |      |
| Favorable years                 |              | 1,500                                                                                      | 600       | 800                | 1,900    | ---  |
| Normal years                    |              | 1,100                                                                                      | 450       | 600                | 1,400    | ---  |
| Unfavorable years               |              | 600                                                                                        | 300       | 400                | 800      | ---  |

## 442--Gund-Bubus-Wendane association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Gund                                                                                       | Bubus    | Wendane  | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 15-20                                                                                      | ---      | 40-60    | 50-60              | 15-20    | 5-15     |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-10     | ---      | ---                | 2-10     | ---      |
| Inland saltgrass                | DIST         | 2-10                                                                                       | ---      | 5-10     | ---                | 2-10     | 5-10     |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---      | 15-30    | ---                | ---      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | 5-15               | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10     | ---      | ---                | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | ---      | 2-8                | 2-8      | T-5      |
| Black greasewood                | SAVE4        | 40-60                                                                                      | 15-30    | 5-15     | 2-10               | 40-60    | 60-75    |
| Shadscale                       | ATCO         | ---                                                                                        | 30-50    | ---      | ---                | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 5-15     | ---      | ---                | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15     | ---      | ---                | ---      | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---      | 1-2      | ---                | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | 1-2      | 2-5                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | 15-20              | ---      | ---      |
| Range site number               |              | 024X008N                                                                                   | 024X003N | 024X007N | 024X006N           | 024X008N | 024X011N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 600      | 1,900    | 1,500              | 800      | 500      |
| Normal years                    |              | 600                                                                                        | 450      | 1,400    | 1,100              | 600      | 350      |
| Unfavorable years               |              | 400                                                                                        | 300      | 800      | 600                | 400      | 200      |



## 443--Gund-Batan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Gund                                                                                       | Batan    | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 5-20                                                                                       | ---      | 5-15               | 40-60    | ---      |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-10     | ---                | ---      | ---      |
| Inland saltgrass                | DIST         | 2-10                                                                                       | ---      | 5-10               | 5-10     | 10-25    |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---      | ---                | 15-30    | ---      |
| Nuttall alkaligrass             | PUAI         | ---                                                                                        | ---      | ---                | ---      | 5-10     |
| Baltic rush                     | JUBA         | ---                                                                                        | ---      | ---                | ---      | 5-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10     | ---                | ---      | ---      |
| Cinquefoil                      | POTEN        | ---                                                                                        | ---      | ---                | ---      | 5-10     |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | ---                | ---      | 2-5      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | T-5                | ---      | ---      |
| Black greasewood                | SAVE4        | 40-60                                                                                      | 15-30    | 60-75              | 5-15     | T-5      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-50    | ---                | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 5-15     | ---                | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15     | ---                | ---      | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---      | ---                | 1-2      | 20-35    |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---                | 1-2      | T-5      |
| Range site number               |              | 024X008N                                                                                   | 024X003N | 024X011N           | 024X007N | 024X044N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 600      | 500                | 1,900    | 350      |
| Normal years                    |              | 600                                                                                        | 450      | 350                | 1,400    | 225      |
| Unfavorable years               |              | 400                                                                                        | 300      | 200                | 800      | 150      |

## 461--Hapgood-Packer-Layview association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name        | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |        |         |                    |     |       |     |
|--------------------------|--------------|--------------------------------------------------------------------------------------------|--------|---------|--------------------|-----|-------|-----|
|                          |              | Soil name                                                                                  |        |         | Inclusion number-- |     |       |     |
|                          |              | Hapgood                                                                                    | Packer | Layview | 1                  | 2   | 3     | 4   |
| Mountain brome           | BRMA4        | 10-15                                                                                      | ---    | ---     | ---                | --- | ---   | X   |
| Slender wheatgrass       | AGTR         | 10-15                                                                                      | ---    | ---     | 2-5                | --- | ---   | X   |
| Bearded wheatgrass       | AGSU         | 10-15                                                                                      | ---    | ---     | ---                | --- | ---   | --- |
| Idaho fescue             | FEID         | 5-15                                                                                       | 10-20  | 10-20   | ---                | --- | 25-50 | X   |
| Bluebunch wheatgrass     | AGSP         | 5-10                                                                                       | ---    | ---     | ---                | --- | 15-30 | --- |
| Spike fescue             | HEKI         | 2-15                                                                                       | ---    | ---     | ---                | --- | 2-10  | --- |
| Bulbous oniongrass       | MEBU         | 2-5                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Nevada bluegrass         | PONE3        | 2-5                                                                                        | ---    | ---     | ---                | --- | ---   | --- |
| Webber ricegrass         | ORWE         | ---                                                                                        | 5-10   | 5-10    | ---                | --- | ---   | --- |
| Bottlebrush squirreltail | SIHY         | ---                                                                                        | 5-10   | 5-10    | ---                | --- | ---   | --- |
| Cusick bluegrass         | POCU3        | ---                                                                                        | 2-5    | 2-5     | ---                | --- | ---   | --- |
| Sandberg bluegrass       | POSE         | ---                                                                                        | 2-5    | 2-5     | ---                | --- | ---   | --- |
| Pine bluegrass           | POSC         | ---                                                                                        | 2-5    | 2-5     | ---                | --- | ---   | --- |
| Letterman needlegrass    | STLE4        | ---                                                                                        | ---    | ---     | 60-70              | --- | ---   | --- |
| Columbia needlegrass     | STCO3        | ---                                                                                        | ---    | ---     | 2-5                | --- | ---   | --- |
| Thurber needlegrass      | STTH2        | ---                                                                                        | ---    | ---     | ---                | --- | 2-10  | --- |
| Other perennial grasses  | PPGG         | ---                                                                                        | ---    | ---     | 2-5                | --- | ---   | X   |
| Geranium                 | GERAN        | 2-5                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Groundsel                | SENEC        | 2-5                                                                                        | ---    | ---     | ---                | --- | ---   | --- |
| Lupine                   | LUPIN        | 2-5                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Goldenweed               | HAPLO2       | ---                                                                                        | 2-5    | 2-5     | ---                | --- | ---   | --- |
| Phlox                    | PHLOX        | ---                                                                                        | 2-5    | 2-5     | ---                | --- | ---   | --- |
| Tailcup lupine           | LUCA         | ---                                                                                        | ---    | ---     | 20-40              | --- | ---   | --- |
| balsamroot               | BALSA        | ---                                                                                        | ---    | ---     | ---                | --- | 2-5   | --- |
| Horsemint                | AGUR         | ---                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Columbine                | AQUIL        | ---                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Meadowrue                | THALI2       | ---                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Sweet cicely             | OSMOR        | ---                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Other perennial forbs    | PPFF         | ---                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Serviceberry             | AMELA        | 5-10                                                                                       | ---    | ---     | ---                | --- | ---   | --- |
| Mountain big sagebrush   | ARTRV        | 5-10                                                                                       | ---    | ---     | ---                | --- | ---   | --- |
| Snowberry                | SYMPH        | 2-10                                                                                       | ---    | ---     | ---                | --- | ---   | X   |
| Low sagebrush            | ARAR8        | ---                                                                                        | 5-15   | 5-15    | ---                | --- | 10-20 | --- |
| Black sagebrush          | ARARN        | ---                                                                                        | 5-15   | 5-15    | ---                | --- | ---   | --- |
| Douglas rabbitbrush      | CHVI8        | ---                                                                                        | ---    | ---     | ---                | --- | 2-5   | --- |
| Big sagebrush            | ARTR2        | ---                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Currant                  | RIBES        | ---                                                                                        | ---    | ---     | ---                | --- | ---   | X   |
| Quaking aspen            | POTR5        | ---                                                                                        | ---    | ---     | ---                | --- | ---   | X   |

| Range site number               | 024X032N | 024X016N | 024X016N | 025X028N | None | 024X027N | 025X065N |
|---------------------------------|----------|----------|----------|----------|------|----------|----------|
| Potential production (lb/acre): |          |          |          |          |      |          |          |
| Favorable years                 | 2,200    | 350      | 350      | 1,000    | ---  | 1,200    | 800      |
| Normal years                    | 1,700    | 250      | 250      | 800      | ---  | 800      | 600      |
| Unfavorable years               | 1,200    | 150      | 150      | 500      | ---  | 600      | 400      |

## 466--Hapgood-Tusel-Winada association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Hapgood                                                                                    | Tusel    | Winada   | 1                  | 2        | 3        |
| Mountain brome                  | BRMA4        | 10-15                                                                                      | 2-5      | ---      | ---                | ---      | 10-15    |
| Slender wheatgrass              | AGTR         | 10-15                                                                                      | ---      | ---      | ---                | ---      | 10-15    |
| Bearded wheatgrass              | AGSU         | 10-15                                                                                      | ---      | ---      | ---                | ---      | 10-15    |
| Idaho fescue                    | FEID         | 5-15                                                                                       | 30-60    | 25-50    | ---                | 10-20    | 5-15     |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 15-30    | ---                | ---      | 5-10     |
| Spike fescue                    | HEKI         | 2-15                                                                                       | ---      | 2-10     | ---                | ---      | 2-15     |
| Bulbous oniongrass              | MEBU         | 2-5                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Nevada bluegrass                | PONE3        | 2-5                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-10     | ---      | ---                | 2-5      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 2-10     | ---                | ---      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Geranium                        | GERAN        | 2-5                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Groundsel                       | SENEC        | 2-5                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Lupine                          | LUPIN        | 2-5                                                                                        | 1-2      | ---      | ---                | ---      | 2-5      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---      |
| balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Serviceberry                    | AMELA        | 5-10                                                                                       | ---      | ---      | ---                | ---      | 5-10     |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | 5-15     | ---      | ---                | ---      | 5-10     |
| Snowberry                       | SYMPH        | 2-10                                                                                       | 2-5      | ---      | ---                | ---      | 2-10     |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 10-20    | ---                | 5-15     | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---      |
| Range site number               |              | 024X032N                                                                                   | 024X023N | 024X027N | None               | 024X016N | 024X032N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 2,200                                                                                      | 1,500    | 1,200    | ---                | 350      | 1,200    |
| Normal years                    |              | 1,700                                                                                      | 1,200    | 800      | ---                | 250      | 1,700    |
| Unfavorable years               |              | 1,200                                                                                      | 900      | 600      | ---                | 150      | 1,200    |

## 467---Hapgood-Sumine-Cleavage association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |
|                                 |              | Hapgood                                                                                    | Sumine   | Cleavage | 1                  | 2    | 3        |
| Mountain brome                  | BRMA4        | 10-15                                                                                      | 2-15     | ---      | ---                | ---  | X        |
| Slender wheatgrass              | AGTR         | 10-15                                                                                      | ---      | ---      | ---                | ---  | X        |
| Bearded wheatgrass              | AGSU         | 10-15                                                                                      | ---      | ---      | ---                | ---  | ---      |
| Idaho fescue                    | FEID         | 5-15                                                                                       | 1-10     | 10-20    | 10-20              | ---  | X        |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 20-50    | ---      | ---                | ---  | ---      |
| Spike fescue                    | HEKI         | 2-15                                                                                       | ---      | ---      | ---                | ---  | ---      |
| Bulbous oniongrass              | MEBU         | 2-5                                                                                        | ---      | ---      | ---                | ---  | X        |
| Nevada bluegrass                | PONE3        | 2-5                                                                                        | ---      | ---      | ---                | ---  | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 5-10     | ---      | ---                | ---  | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-5      | 5-10     | 5-10               | ---  | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10     | 5-10               | ---  | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | 2-5      | 2-5                | ---  | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | 2-5                | ---  | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5      | 2-5                | ---  | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---  | X        |
| Geranium                        | GERAN        | 2-5                                                                                        | ---      | ---      | ---                | ---  | X        |
| Groundsel                       | SENEC        | 2-5                                                                                        | ---      | ---      | ---                | ---  | ---      |
| Lupine                          | LUPIN        | 2-5                                                                                        | ---      | ---      | ---                | ---  | X        |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5      | 2-5                | ---  | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5      | 2-5                | ---  | ---      |
| Horsemint                       | AGUR         | ---                                                                                        | ---      | ---      | ---                | ---  | X        |
| Columbine                       | AQUIL        | ---                                                                                        | ---      | ---      | ---                | ---  | X        |
| Meadowrue                       | THALI2       | ---                                                                                        | ---      | ---      | ---                | ---  | X        |
| Sweet cicely                    | OSMOR        | ---                                                                                        | ---      | ---      | ---                | ---  | X        |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | ---  | X        |
| Serviceberry                    | AMELA        | 5-10                                                                                       | ---      | ---      | ---                | ---  | ---      |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | 5-15     | ---      | ---                | ---  | ---      |
| Snowberry                       | SYMPH        | 2-10                                                                                       | ---      | ---      | ---                | ---  | X        |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 5-15     | 5-15               | ---  | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | 5-15               | ---  | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | ---                | ---  | X        |
| Currant                         | RIBES        | ---                                                                                        | ---      | ---      | ---                | ---  | X        |
| Quaking aspen                   | POTR5        | ---                                                                                        | ---      | ---      | ---                | ---  | X        |
| Range site number               |              | 024X032N                                                                                   | 024X029N | 024X016N | 024X016N           | None | 025X065N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |
| Favorable years                 |              | 2,200                                                                                      | 1,500    | 350      | 350                | ---  | 800      |
| Normal years                    |              | 1,700                                                                                      | 1,100    | 250      | 250                | ---  | 600      |
| Unfavorable years               |              | 1,200                                                                                      | 800      | 150      | 150                | ---  | 400      |

## 482--Humdun-Havingdon-Bucan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |           |          | Inclusion number-- |          |      |
|                                 |              | Humdun                                                                                     | Havingdon | Bucan    | 1                  | 2        | 3    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 15-25     | 20-50    | ---                | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 15-25     | 5-10     | ---                | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---       | ---      | 50-60              | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---       | ---      | 5-15               | ---      | ---  |
| Mat muhly                       | MURI         | ---                                                                                        | ---       | ---      | 2-10               | ---      | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---       | ---      | 1-5                | ---      | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | ---       | ---      | ---                | 50-70    | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---       | ---      | ---                | 2-10     | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---       | ---      | ---                | 2-10     | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---       | ---      | ---                | 2-5      | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-20     | ---      | 15-20              | ---      | ---  |
| balsamroot                      | BALSA        | 2-4                                                                                        | ---       | 2-4      | ---                | 2-5      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-5       | 2-4      | ---                | 2-5      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5       | ---      | ---                | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-10      | ---      | 5-10               | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 5-10      | 15-20    | ---                | 2-5      | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---       | 2-5      | ---                | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---       | 2-5      | ---                | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-10      | ---      | ---                | 2-5      | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---       | ---      | 10-15              | ---      | ---  |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---       | ---      | ---                | T-2      | ---  |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---       | ---      | ---                | T-2      | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10      | 2-10     | 2-5                | ---      | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X035N  | 024X005N | 025X003N           | 024X033N | None |
| Potential production (lb/acre): |              |                                                                                            |           |          |                    |          |      |
| Favorable years                 |              | 800                                                                                        | 500       | 800      | 2,500              | 800      | ---  |
| Normal years                    |              | 600                                                                                        | 400       | 600      | 1,900              | 600      | ---  |
| Unfavorable years               |              | 400                                                                                        | 250       | 400      | 1,200              | 400      | ---  |

## 486--Havingdon-Burrita association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Havingdon                                                                                  | Burrita  | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 15-25                                                                                      | 5-10     | 5-10               | ---      | 40-60    |
| Thurber needlegrass             | STTH2        | 15-25                                                                                      | 20-50    | 20-50              | ---      | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---                | 2-10     | ---      |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | ---                | 2-10     | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---                | 1-3      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---                | ---      | 2-10     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | ---      | 2-5      |
| Other perennial grasses         | PPGG         | 10-20                                                                                      | ---      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-4      | 2-4                | ---      | 2-5      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---                | ---      | 2-5      |
| balsamroot                      | BALSA        | ---                                                                                        | 2-4      | 2-4                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-10                                                                                       | ---      | ---                | 2-8      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | 15-20    | 15-20              | ---      | 5-10     |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | ---      | ---                | ---      | T-5      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 2-5                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | 2-5                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---                | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---                | 15-30    | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10               | ---      | ---      |
| Range site number               |              | 024X035N                                                                                   | 024X005N | 024X005N           | 024X025N | 024X028N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 800      | 800                | 250      | 1,000    |
| Normal years                    |              | 400                                                                                        | 600      | 600                | 150      | 700      |
| Unfavorable years               |              | 250                                                                                        | 400      | 400                | 75       | 500      |

## 511--Hessing silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Hessing                                                                                    | 1                  | 2        | 3        | 4        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | ---      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | ---      | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | ---      | T-10     | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | 30-50    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 5-15     | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | ---      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | ---      | 2-5      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---                | ---      | 15-30    | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | ---      | 2-15     | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X003N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 600      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      | 300      |

## 512--Hessing-Relley association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Hessing                                                                                    | Relley   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-10     | 5-15               | 5-15     | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 10-30    | 5-15               | 5-15     | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | 1-3                | 1-3      | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | T-5      | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | ---      | 50-60    |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---                | ---      | 5-15     |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | T-5      | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | 20-30              | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---      | 2-5                | 2-5      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | 2-5                | 2-5      | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | 50-65    | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | ---      | 15-20    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---                | ---      | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---                | ---      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X012N | 024X002N           | 024X002N | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      | 1,500    |
| Normal years                    |              | 450                                                                                        | 400      | 450                | 450      | 1,100    |
| Unfavorable years               |              | 300                                                                                        | 200      | 300                | 300      | 600      |



## 530--Humboldt fine sandy loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Humboldt                                                                                   | 1                  | 2        | 3        |
| Wildrye                         | ELMYU        | 30-60                                                                                      | 30-60              | 30-60    | 30-60    |
| Nevada bluegrass                | PONE3        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | 2-10               | 2-10     | 2-10     |
| Other perennial grasses         | PPGG         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sierra clover                   | TRWO         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Willow                          | SALIX        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Basin big sagebrush             | ARTRT*       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Silver sagebrush                | ARCA13       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other shrubs                    | SSSS         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Range site number               |              | 025X001N                                                                                   | 025X001N           | 025X001N | 025X001N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 3,000                                                                                      | 3,000              | 3,000    | 3,000    |
| Normal years                    |              | 2,500                                                                                      | 2,500              | 2,500    | 2,500    |
| Unfavorable years               |              | 1,800                                                                                      | 1,800              | 1,800    | 1,800    |

## 531--Humboldt silty clay

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Humboldt                                                                                   | 1                  | 2        | 3        |
| Wildrye                         | ELMYU        | 30-60                                                                                      | 30-60              | 30-60    | 30-60    |
| Nevada bluegrass                | PONE3        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | 2-10               | 2-10     | 2-10     |
| Other perennial grasses         | PPGG         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sierra clover                   | TRWO         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Willow                          | SALIX        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Basin big sagebrush             | ARTRT*       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Silver sagebrush                | ARCA13       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other shrubs                    | SSSS         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Range site number               |              | 025X001N                                                                                   | 025X001N           | 025X001N | 025X001N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 3,000                                                                                      | 3,000              | 3,000    | 3,000    |
| Normal years                    |              | 2,500                                                                                      | 2,500              | 2,500    | 2,500    |
| Unfavorable years               |              | 1,800                                                                                      | 1,800              | 1,800    | 1,800    |

## 532--Humboldt silty clay loam, slightly saline

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Humboldt                                                                                   | 1                  | 2        | 3        |
| Wildrye                         | ELMYU        | 30-60                                                                                      | 30-60              | ---      | ---      |
| Nevada bluegrass                | PONE3        | 5-10                                                                                       | 5-10               | ---      | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | ---      | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | 2-10               | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | 5-10     | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | ---      | 15-40    |
| Alkali muhly                    | MUAS         | ---                                                                                        | ---                | ---      | 10-20    |
| Alkali bluegrass                | POJU         | ---                                                                                        | ---                | ---      | 5-15     |
| Alkali cordgrass                | SPGR         | ---                                                                                        | ---                | ---      | 5-10     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---                | ---      | 2-5      |
| Arrowgrass                      | TRIGL        | ---                                                                                        | ---                | ---      | 1-3      |
| Other perennial grasses         | PPGG         | 5-15                                                                                       | 5-15               | T-10     | ---      |
| Sierra clover                   | TRWO         | 2-5                                                                                        | 2-5                | ---      | ---      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 5-10               | 2-8      | ---      |
| Willow                          | SALIX        | 5-10                                                                                       | 5-10               | ---      | T-2      |
| Basin big sagebrush             | ARTRT*       | 2-5                                                                                        | 2-5                | ---      | ---      |
| Silver sagebrush                | ARCA13       | 2-5                                                                                        | 2-5                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 30-50    | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---                | 15-30    | T-2      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | 5-15     | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | ---      |
| Silver buffaloberry             | SHAR         | ---                                                                                        | ---                | ---      | T-2      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---                | ---      | T-2      |
| Woods rose                      | ROWO         | ---                                                                                        | ---                | ---      | T-2      |
| Other shrubs                    | SSSS         | 2-8                                                                                        | 2-8                | ---      | ---      |
| Range site number               |              | 025X001N                                                                                   | 025X001N           | 024X003N | 024X009N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 3,000                                                                                      | 3,000              | 600      | 1,500    |
| Normal years                    |              | 2,500                                                                                      | 2,500              | 450      | 1,000    |
| Unfavorable years               |              | 1,800                                                                                      | 1,800              | 300      | 700      |

## 571--Jenor-Blacka very fine sandy loams

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Jenor                                                                                      | Blacka   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3                | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40              | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30              | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      |

## 573--Jenor-Beoska-Broyles association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Jenor                                                                                      | Beoska   | Broyles  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 2-10               | 5-15     | 2-5      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     | 2-5      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-10               | 2-5      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | ---                | 1-3      | 2-5      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | 10-20              | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | ---      | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | ---                | 2-8      | 5-10     |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | ---                | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | ---                | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | 2-5      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | ---                | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | 30-35              | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    |
| Greene rabbitbrush              | CHGR6        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Nevada ephedra                  | EPNE         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X020N           | 024X002N | 028B009N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      | 400      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      | 300      |

## 590--Landco silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Landco                                                                                     | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-30                                                                                      | ---                | ---      | 10-30    |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Alkali sacaton                  | SPAI         | T-5                                                                                        | ---                | ---      | T-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10               | T-10     | ---      |
| Perennial forbs                 | PPFF         | T-5                                                                                        | 2-8                | 2-8      | T-5      |
| Saltbush                        | ATRIP        | 50-65                                                                                      | ---                | ---      | 50-65    |
| Shadscale                       | ATCO         | ---                                                                                        | 30-50              | 30-50    | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | 15-30              | 15-30    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 5-15               | 5-15     | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15               | 2-15     | ---      |
| Range site number               |              | 024X012N                                                                                   | 024X003N           | 024X003N | 024X012N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 600                | 600      | 700      |
| Normal years                    |              | 400                                                                                        | 450                | 450      | 400      |
| Unfavorable years               |              | 200                                                                                        | 300                | 300      | 200      |

## 602--Misad gravelly sandy loam, strongly saline-sodic

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Misad                                                                                      | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 5-10     |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10               | T-10     |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50              | 30-50    |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30              | 15-30    |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15               | 5-15     |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15               | 2-15     |
| Range site number               |              | 024X003N                                                                                   | 024X003N           | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 600                                                                                        | 600                | 600      |
| Normal years                    |              | 450                                                                                        | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      |

## 605--Misad-Creemon-Rednik association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Misad                                                                                      | Creemon  | Rednik   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 2-10               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-10               | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | ---                | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | 10-20              | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 1-2                | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | ---                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | ---                | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | ---                | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | ---                | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | 30-35              | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X020N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      |



## 631--McConnel-Tulase association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | McConnel                                                                                   | Tulase   | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---                | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 50-60              | 5-20     | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | 5-15               | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---                | 2-5      | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | ---      | T-10     |
| balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---                | ---      | ---      |
| Thelypody                       | THELY        | ---                                                                                        | ---      | ---                | 2-4      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8                | ---      | 2-8      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---                | 5-10     | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---                | 5-15     | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 15-20              | 5-15     | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | 2-10               | 20-30    | 15-30    |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---                | ---      | 30-50    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---                | ---      | 5-15     |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---                | ---      | 2-15     |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---                | ---      | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X006N           | 024X022N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 1,500              | 800      | 600      |
| Normal years                    |              | 600                                                                                        | 600      | 1,100              | 600      | 450      |
| Unfavorable years               |              | 400                                                                                        | 400      | 600                | 350      | 300      |

## 660--Needle Peak silt loam, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Needle Peak                                                                                | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | 50-60              | ---      | ---      |
| Western wheatgrass              | AGSM         | 5-15                                                                                       | 5-15               | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | 5-10     | 5-15     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---                | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---                | ---      | 2-5      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---                | ---      | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | T-10     | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Basin big sagebrush             | ARTRT*       | 15-20                                                                                      | 15-20              | ---      | ---      |
| Black greasewood                | SAVE4        | 2-10                                                                                       | 2-10               | 15-30    | ---      |
| Rubber rabbitbrush              | CHNA2        | 2-5                                                                                        | 2-5                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 30-50    | 30-40    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | 5-15     | 20-30    |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---                | ---      | 2-5      |
| Winterfat                       | EULA5        | ---                                                                                        | ---                | ---      | 2-5      |
| Range site number               |              | 024X006N                                                                                   | 024X006N           | 024X003N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,500                                                                                      | 1,500              | 600      | 700      |
| Normal years                    |              | 1,100                                                                                      | 1,100              | 450      | 450      |
| Unfavorable years               |              | 600                                                                                        | 600                | 300      | 300      |

## 670--Filiran-Pineval-Kingingham association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |            |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|------------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |            | Inclusion number-- |          |
|                                 |              | Filiran                                                                                    | Pineval  | Kingingham | 1                  | 2        |
| Indian ricegrass                | ORHY         | 20-30                                                                                      | 20-30    | 5-15       | 20-30              | 20-30    |
| Needleandthread                 | STCO4        | 10-20                                                                                      | 10-20    | 1-3        | 10-20              | 10-20    |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10     | 5-15       | 5-10               | 5-10     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5        | 2-5                | 2-5      |
| Perennial forbs                 | PPFF         | 2-5                                                                                        | 2-5      | 2-8        | 2-5                | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---        | 15-20              | 15-20    |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40      | ---                | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30      | ---                | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5        | ---                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5        | ---                | ---      |
| Other shrubs                    | SSSS         | 5-15                                                                                       | 5-15     | ---        | 5-15               | 5-15     |
| Range site number               |              | 028B010N                                                                                   | 028B010N | 024X002N   | 028B010N           | 028B010N |
| Potential production (lb/acre): |              |                                                                                            |          |            |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | 700        | 800                | 800      |
| Normal years                    |              | 600                                                                                        | 600      | 450        | 600                | 600      |
| Unfavorable years               |              | 400                                                                                        | 400      | 300        | 400                | 400      |

## 680--Skullwak-Umberland-Wendane association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |           |          | Inclusion number-- |          |      |
|                                 |              | Skullwak                                                                                   | Umberland | Wendane  | 1                  | 2        | 3    |
| Inland saltgrass                | DIST         | 10-25                                                                                      | 5-10      | 5-10     | ---                | ---      | ---  |
| Nuttall alkaligrass             | PUIA         | 5-10                                                                                       | ---       | ---      | ---                | ---      | ---  |
| Baltic rush                     | JUBA         | 5-10                                                                                       | ---       | ---      | ---                | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 5-15      | 40-60    | ---                | ---      | ---  |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---       | 15-30    | ---                | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---       | ---      | ---                | 5-10     | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---       | ---      | ---                | T-10     | ---  |
| Cinquefoil                      | POTEN        | 5-10                                                                                       | ---       | ---      | ---                | ---      | ---  |
| Eriogonum                       | ERIOG        | 2-5                                                                                        | ---       | ---      | ---                | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | T-5       | ---      | ---                | 2-8      | ---  |
| Alkali rabbitbrush              | CHAL9        | 20-35                                                                                      | ---       | 1-2      | ---                | ---      | ---  |
| Black greasewood                | SAVE4        | T-5                                                                                        | 60-75     | 5-15     | ---                | 15-30    | ---  |
| Rubber rabbitbrush              | CHNA2        | T-5                                                                                        | ---       | 1-2      | ---                | ---      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---       | ---      | ---                | 30-50    | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---       | ---      | ---                | 5-15     | ---  |
| Seepweed                        | SUAED        | ---                                                                                        | ---       | ---      | ---                | 2-15     | ---  |
| Range site number               |              | 024X044N                                                                                   | 024X011N  | 024X007N | None               | 024X003N | None |
| Potential production (lb/acre): |              |                                                                                            |           |          |                    |          |      |
| Favorable years                 |              | 350                                                                                        | 500       | 1,900    | ---                | 600      | ---  |
| Normal years                    |              | 225                                                                                        | 350       | 1,400    | ---                | 450      | ---  |
| Unfavorable years               |              | 150                                                                                        | 200       | 800      | ---                | 300      | ---  |

## 684--Ocala silt loam, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Ocala                                                                                      | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | ---                | 50-60    | 5-15     |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---                | ---      | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | ---                | ---      | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-10               | ---      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---                | 5-15     | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10               | ---      | ---      |
| Perennial forbs                 | PPFF         | ---                                                                                        | 2-8                | 2-8      | T-5      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 15-30              | 2-10     | 60-75    |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---                | 2-5      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-50              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 5-15               | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15               | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | 15-20    | ---      |
| Range site number               |              | 024X007N                                                                                   | 024X003N           | 024X006N | 024X011N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,900                                                                                      | 600                | 1,500    | 500      |
| Normal years                    |              | 1,400                                                                                      | 450                | 1,100    | 350      |
| Unfavorable years               |              | 800                                                                                        | 300                | 600      | 200      |

700--Orovada fine sandy loam, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Orovada                                                                                    | 1                  | 2        | 3        | 4        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---                | ---      | ---      | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 10-20    | 20-40    |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-15               | 5-15     | 2-5      | ---      |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | 2-5                | 2-5      | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | 1-3      | 20-30    | 5-15     |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | ---                | ---      | 2-10     | 2-10     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---                | ---      | ---      | 2-10     |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | ---                | ---      | ---      | ---      |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---                | ---      | ---      | ---      |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---                | ---      | ---      | ---      |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | ---                | ---      | ---      | 2-5      |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | ---                | ---      | ---      | 2-4      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8                | 2-8      | 10-20    | ---      |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | ---                | ---      | T-5      | ---      |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 2-5                | 2-5      | T-5      | 5-10     |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40              | 30-40    | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30              | 20-30    | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | 2-5      | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | ---      | 5-15     | 10-20    |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---                | ---      | ---      | 2-10     |
| Hairy horsebrush                | TECO2        | ---                                                                                        | ---                | ---      | ---      | 5-8      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---                | ---      | ---      | 2-8      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---                | ---      | ---      | 1-5      |
| Range site number               |              | 024X020N                                                                                   | 024X002N           | 024X002N | 024X017N | 024X001N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 900      | 800      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 700      | 500      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 500      | 300      |

## 701--Orovada fine sandy loam, 2 to 4 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Orovada                                                                                    | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---                | ---      | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 10-20    |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-15               | 5-15     | 2-5      |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | 1-3      | 20-30    |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | ---                | ---      | 2-10     |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | ---                | ---      | ---      |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---                | ---      | ---      |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8                | 2-8      | 10-20    |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | ---                | ---      | T-5      |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 2-5                | 2-5      | T-5      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30              | 20-30    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | 2-5      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | ---      | 5-15     |
| Range site number               |              | 024X020N                                                                                   | 024X002N           | 024X002N | 024X017N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 900      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 700      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 500      |

702--Orovada fine sandy loam, cemented substratum, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Orovada                                                                                    | 1                  | 2        | 3        | 4        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---                | ---      | ---      | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     | 10-20    |
| Bottlebrush squirreltail        | SIHV         | 2-10                                                                                       | 5-15               | 5-15     | 5-15     | 2-5      |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | 2-5                | 2-5      | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | 1-3      | 1-3      | 20-30    |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | ---                | ---      | ---      | 2-10     |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | ---                | ---      | ---      | ---      |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---                | ---      | ---      | ---      |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---                | ---      | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8                | 2-8      | 2-8      | 10-20    |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | ---                | ---      | ---      | T-5      |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 2-5                | 2-5      | 2-5      | T-5      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40              | 30-40    | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30              | 20-30    | 20-30    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | 2-5      | 2-5      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | ---      | ---      | 5-15     |
| Range site number               |              | 024X020N                                                                                   | 024X002N           | 024X002N | 024X002N | 024X017N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      | 900      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      | 700      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      | 500      |



## 703--Orovada-Goldrun complex

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Orovada                                                                                    | Goldrun  | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---      | ---                | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 20-40    | 5-15               | 10-20    |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | ---      | 5-15               | 2-5      |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | ---      | 2-5                | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 5-15     | 1-3                | 20-30    |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-10     | ---                | ---      |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | 2-10     | ---                | 2-10     |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | ---      | ---                | ---      |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---      | ---                | ---      |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---      | ---                | ---      |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | 2-5      | ---                | ---      |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | 2-4      | ---                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8                | 10-20    |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | ---      | ---                | T-5      |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 5-10     | 2-5                | T-5      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 10-20    | ---                | 5-15     |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | 2-10     | ---                | ---      |
| Hairy horsebrush                | TECO2        | ---                                                                                        | 5-8      | ---                | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | 2-8      | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-5      | ---                | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30              | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5                | ---      |
| Range site number               |              | 024X020N                                                                                   | 024X001N | 024X002N           | 024X017N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 800      | 700                | 900      |
| Normal years                    |              | 450                                                                                        | 500      | 450                | 700      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 500      |

## 704--Orovada-Kodra-Puett association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Orovada                                                                                    | Kodra    | Puett    | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---      | ---                | 20-50    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---      | ---                | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 10-30    | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10     | ---                | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 10-20    | ---                | ---      |
| balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---      | ---                | 2-4      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---      | ---                | 2-4      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 5-15     | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 10-25    | ---                | 15-20    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 1-5      | ---                | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 1-5      | ---                | 2-5      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | 1-5      | ---                | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | ---      |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | T-5      | ---                | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-4      | ---                | 2-10     |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 025X025N | None               | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | 200      | ---                | 800      |
| Normal years                    |              | 600                                                                                        | 600      | 150      | ---                | 600      |
| Unfavorable years               |              | 400                                                                                        | 400      | 100      | ---                | 400      |

## 705--Orovada-Creemon complex

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Orovada                                                                                    | Creemon  | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---      | ---                | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 10-20    |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-15     | 5-15               | 2-5      |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | 2-5      | 2-5                | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | 1-3                | 20-30    |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | ---      | ---                | 2-10     |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | ---      | ---                | ---      |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---      | ---                | ---      |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---      | ---                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | 2-8                | 10-20    |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | ---      | ---                | T-5      |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 2-5      | 2-5                | T-5      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | 20-30              | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | 2-5                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | 5-15     |
| Range site number               |              | 024X020N                                                                                   | 024X002N | 024X002N           | 024X017N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 900      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 700      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 500      |

## 706--Orovada-Wieland-Chiara association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Orovada                                                                                    | Wieland  | Chiara   | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50    | 20-50              | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10     | 5-10               | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | 50-60    | 10-20    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | 1-5      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | 15-20    | ---      |
| balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4      | 2-4                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4      | 2-4                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20    | 15-20              | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      | 15-30    |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 10-15    | 15-25    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Anderson peachbrush             | PRAN2        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10     | 2-10               | 2-5      | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N | 024X005N           | 025X003N | 024X041N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 800      | 800                | 2,500    | 1,000    |
| Normal years                    |              | 600                                                                                        | 600      | 600      | 600                | 1,900    | 800      |
| Unfavorable years               |              | 400                                                                                        | 400      | 400      | 400                | 1,200    | 600      |

## 707--Orovada-Goldrun association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |      |
|                                 |              | Orovada                                                                                    | Goldrun  | 1                  | 2        | 3    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---      | 20-50              | 20-50    | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | 5-10               | 5-10     | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | 20-40    | ---                | ---      | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | 5-15     | ---                | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-10     | ---                | ---      | ---  |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | 2-10     | ---                | ---      | ---  |
| balsamroot                      | BALSA        | 2-4                                                                                        | ---      | 2-4                | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | 2-4                | 2-4      | ---  |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | 2-5      | ---                | ---      | ---  |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | 2-4      | ---                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 15-20              | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | 2-5                | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-10     | 2-5                | 2-5      | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 10-20    | ---                | ---      | ---  |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | 2-10     | ---                | ---      | ---  |
| Hairy horsebrush                | TECO2        | ---                                                                                        | 5-8      | ---                | ---      | ---  |
| Black greasewood                | SAVE4        | ---                                                                                        | 2-8      | ---                | ---      | ---  |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-5      | ---                | ---      | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | 2-10               | 2-10     | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X001N | 024X005N           | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |      |
| Favorable years                 |              | 800                                                                                        | 800      | 800                | 800      | ---  |
| Normal years                    |              | 600                                                                                        | 500      | 600                | 600      | ---  |
| Unfavorable years               |              | 400                                                                                        | 300      | 400                | 400      | ---  |

## 708--Orovada-Reina-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |
|                                 |              | Orovada                                                                                    | Reina    | Rock outcrop | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | 20-50    | ---          | 20-50              | 20-50    |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | ---          | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | ---      | ---          | ---                | ---      |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | ---      | ---          | ---                | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---          | 5-10               | 5-10     |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | 2-4      | ---          | 2-4                | 2-4      |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---      | ---          | ---                | ---      |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---      | ---          | ---                | ---      |
| balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---          | 2-4                | 2-4      |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | 15-20    | ---          | 15-20              | 15-20    |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 2-5      | ---          | 2-5                | 2-5      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---          | 2-5                | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---          | 2-10               | 2-10     |
| Range site number               |              | 024X020N                                                                                   | 024X005N | None         | 024X005N           | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |
| Favorable years                 |              | 700                                                                                        | 800      | ---          | 800                | 800      |
| Normal years                    |              | 450                                                                                        | 600      | ---          | 600                | 600      |
| Unfavorable years               |              | 300                                                                                        | 400      | ---          | 400                | 400      |

## 709--Orovada-Sodhouse association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |
|                                 |              | Orovada                                                                                    | Sodhouse | 1                  |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---      | 20-50              |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---                |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-15     | ---                |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | 2-5      | ---                |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | ---                |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | 5-10               |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | ---      | 2-4                |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---      | ---                |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---      | ---                |
| balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4                |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | ---                |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | ---      | 15-20              |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 2-5      | 2-5                |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | ---                |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | ---                |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---                |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5                |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-10               |
| Range site number               |              | 024X020N                                                                                   | 024X002N | 024X005N           |
| Potential production (lb/acre): |              |                                                                                            |          |                    |
| Favorable years                 |              | 700                                                                                        | 700      | 800                |
| Normal years                    |              | 450                                                                                        | 450      | 600                |
| Unfavorable years               |              | 300                                                                                        | 300      | 400                |

## 711--Paranat silty clay loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Paranat                                                                                    | 1                  | 2        | 3        |
| Wildrye                         | ELMYU        | 30-60                                                                                      | 30-60              | 30-60    | 30-60    |
| Nevada bluegrass                | PONE3        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | 2-10               | 2-10     | 2-10     |
| Other perennial grasses         | PPGG         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sierra clover                   | TRWO         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Willow                          | SALIX        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Basin big sagebrush             | ARTRT*       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Silver sagebrush                | ARCA13       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other shrubs                    | SSSS         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Range site number               |              | 025X001N                                                                                   | 025X001N           | 025X001N | 025X001N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 3,000                                                                                      | 3,000              | 3,000    | 3,000    |
| Normal years                    |              | 2,500                                                                                      | 2,500              | 2,500    | 2,500    |
| Unfavorable years               |              | 1,800                                                                                      | 1,800              | 1,800    | 1,800    |



## 713--Paranat silty clay loam, drained

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Paranat                                                                                    | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | 40-60              | 40-60    |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | 15-30              | 15-30    |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 5-15               | 5-15     |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | 1-2                | 1-2      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | 1-2                | 1-2      |
| Range site number               |              | O24X007N                                                                                   | O24X007N           | O24X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 1,900                                                                                      | 1,900              | 1,900    |
| Normal years                    |              | 1,400                                                                                      | 1,400              | 1,400    |
| Unfavorable years               |              | 800                                                                                        | 800                | 800      |

## 714--Paranat silty clay loam, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Paranat                                                                                    | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | ---                | 2-5      |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---                | 15-40    |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     |
| Wildrye                         | ELMYU        | ---                                                                                        | 30-60              | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 5-10               | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | 2-10               | ---      |
| Alkali muhly                    | MUAS         | ---                                                                                        | ---                | 10-20    |
| Alkali bluegrass                | POJU         | ---                                                                                        | ---                | 5-15     |
| Alkali cordgrass                | SPGR         | ---                                                                                        | ---                | 5-10     |
| Arrowgrass                      | TRIGL        | ---                                                                                        | ---                | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-15               | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | 2-5                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 5-10               | ---      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | ---                | T-2      |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---                | T-2      |
| Willow                          | SALIX        | ---                                                                                        | 5-10               | T-2      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 2-5                | ---      |
| Silver sagebrush                | ARCA13       | ---                                                                                        | 2-5                | ---      |
| Silver buffaloberry             | SHAR         | ---                                                                                        | ---                | T-2      |
| Woods rose                      | ROWO         | ---                                                                                        | ---                | T-2      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-8                | ---      |
| Range site number               |              | 024X007N                                                                                   | 025X001N           | 024X009N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 1,900                                                                                      | 3,000              | 1,500    |
| Normal years                    |              | 1,400                                                                                      | 2,500              | 1,000    |
| Unfavorable years               |              | 800                                                                                        | 1,800              | 700      |

## 731--Yipor silt loam, moderately saline-sodic

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Yipor                                                                                      | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---                | 10-30    | 10-30    |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | T-5      | T-5      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10               | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | T-5      | T-5      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50              | ---      | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15               | ---      | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15               | ---      | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---                | 50-65    | 50-65    |
| Range site number               |              | 024X003N                                                                                   | 024X003N           | 024X012N | 024X012N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 600                                                                                        | 600                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 400      | 400      |
| Unfavorable years               |              | 300                                                                                        | 300                | 200      | 200      |

## 770--Prida silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Prida                                                                                      | 1                  | 2        | 3        | 4        |
| Alkali sacaton                  | SPAI         | 40-70                                                                                      | 15-30              | ---      | ---      | 40-70    |
| Inland saltgrass                | DIST         | T-15                                                                                       | 5-10               | ---      | ---      | T-15     |
| Basin wildrye                   | ELCI2        | T-5                                                                                        | 40-60              | ---      | ---      | T-5      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | 5-10     | 5-10     | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | T-10     | T-10     | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | ---                | 2-8      | 2-8      | 2-8      |
| Iodinebush                      | ALOC2        | 10-20                                                                                      | ---                | ---      | ---      | 10-20    |
| Saltbush                        | ATRIP        | 5-10                                                                                       | ---                | ---      | ---      | 5-10     |
| Black greasewood                | SAVE4        | 2-5                                                                                        | 5-15               | 15-30    | 15-30    | 2-5      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | 1-2                | ---      | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-2                | ---      | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 30-50    | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | 5-15     | 5-15     | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | 2-15     | ---      |
| Range site number               |              | 024X010N                                                                                   | 024X007N           | 024X003N | 024X003N | 024X010N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 450                                                                                        | 1,900              | 600      | 600      | 450      |
| Normal years                    |              | 300                                                                                        | 1,400              | 450      | 450      | 300      |
| Unfavorable years               |              | 150                                                                                        | 800                | 300      | 300      | 150      |

## 774--Prida-Sonoma silty clay loams

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Prida                                                                                      | Sonoma   | 1                  | 2        |
| Alkali sacaton                  | SPAI         | 40-70                                                                                      | 15-40    | 15-30              | ---      |
| Inland saltgrass                | DIST         | T-15                                                                                       | 5-10     | 5-10               | ---      |
| Basin wildrye                   | ELCI2        | T-5                                                                                        | 2-5      | 40-60              | ---      |
| Alkali muhly                    | MUAS         | ---                                                                                        | 10-20    | ---                | ---      |
| Alkali bluegrass                | POJU         | ---                                                                                        | 5-15     | ---                | ---      |
| Alkali cordgrass                | SPGR         | ---                                                                                        | 5-10     | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---                | 5-10     |
| Arrowgrass                      | TRIGL        | ---                                                                                        | 1-3      | ---                | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | T-10     |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | ---      | ---                | 2-8      |
| Iodinebush                      | ALOC2        | 10-20                                                                                      | ---      | ---                | ---      |
| Saltbush                        | ATRIP        | 5-10                                                                                       | ---      | ---                | ---      |
| Black greasewood                | SAVE4        | 2-5                                                                                        | T-2      | 5-15               | 15-30    |
| Silver buffaloberry             | SHAR         | ---                                                                                        | T-2      | ---                | ---      |
| Willow                          | SALIX        | ---                                                                                        | T-2      | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | T-2      | 1-2                | ---      |
| Woods rose                      | ROWO         | ---                                                                                        | T-2      | ---                | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---      | 1-2                | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---                | 30-50    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---                | 5-15     |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---                | 2-15     |
| Range site number               |              | 024X010N                                                                                   | 024X009N | 024X007N           | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 450                                                                                        | 1,500    | 1,900              | 600      |
| Normal years                    |              | 300                                                                                        | 1,000    | 1,400              | 450      |
| Unfavorable years               |              | 150                                                                                        | 700      | 800                | 300      |

## 780--Pumper silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Pumper                                                                                     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3                | 1-3      | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATC0         | 30-40                                                                                      | 30-40              | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

## 800--Raglan silt loam, gravelly substratum

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Raglan                                                                                     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3                | 1-3      | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATC0         | 30-40                                                                                      | 30-40              | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

## 804--Raglan silty clay loam, moderately saline

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              |                                                                                            | 1                  | 2        | 3        | 4        |
|                                 |              | Raglan                                                                                     |                    |          |          |          |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-15               | 5-15     | 5-15     | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15               | 5-15     | 5-15     | 10-30    |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | 2-5      | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | 1-3      | 1-3      | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | ---      | ---      | T-5      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---                | ---      | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      | T-5      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-40              | 30-40    | 30-40    | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | ---                | ---      | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 20-30              | 20-30    | 20-30    | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---                | ---      | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5                | 2-5      | 2-5      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | 2-5      | 2-5      | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---                | ---      | ---      | 50-65    |
| Range site number               |              | 024X003N                                                                                   | 024X002N           | 024X002N | 024X002N | 024X012N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 600                                                                                        | 700                | 700      | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      | 400      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      | 200      |



## 805--Raglan silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Raglan                                                                                     | 1                  | 2        | 3        | 4        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-10     | 5-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | ---      | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | ---      | ---      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | ---      | ---      | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | T-10     | T-10     | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-50    | 30-50    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 5-15     | 5-15     | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | ---      | ---      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | ---      | ---      | 2-5      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---                | 15-30    | 15-30    | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | 2-15     | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X003N | 024X003N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 600      | 600      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      | 300      |

## 814--Quarz-Linrose-Slaven association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |      |
|                                 |              | Quarz                                                                                      | Linrose  | Slaven   | 1                  | 2        | 3    | 4    |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 2-10     | 20-50    | ---                | 5-10     | ---  | ---  |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---      | 5-10     | ---                | ---      | ---  | ---  |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | ---      | 2-15     | ---                | 2-5      | ---  | ---  |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | ---      | 2-5      | ---                | ---      | ---  | ---  |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | 2-5      | 5-10               | ---      | ---  | ---  |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 30-60    | 1-10     | 10-20              | 30-60    | ---  | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-10     | ---      | 2-5                | 5-10     | ---  | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---      | 5-10               | ---      | ---  | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | 2-5      | ---                | 1-3      | ---  | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | 2-5      | ---                | ---      | ---  | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---  |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---  | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | ---      | 5-15     | ---                | 5-15     | ---  | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | 10-20    | ---      | 5-15               | ---      | ---  | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | ---      | 5-15               | ---      | ---  | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  | ---  |
| Range site number               |              | 024X029N                                                                                   | 024X042N | 024X029N | 024X016N           | 024X023N | None | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |      |
| Favorable years                 |              | 1,500                                                                                      | 1,000    | 1,500    | 350                | 1,500    | ---  | ---  |
| Normal years                    |              | 1,100                                                                                      | 800      | 1,100    | 250                | 1,200    | ---  | ---  |
| Unfavorable years               |              | 800                                                                                        | 500      | 800      | 150                | 900      | ---  | ---  |

## 816--Quarz-Linrose-Cleavage association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Quarz                                                                                      | Linrose  | Cleavage | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 30-50                                                                                      | 2-10     | 2-5      | 15-30              | 15-30    | 15-30    |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---      | ---      | 2-10               | ---      | 2-10     |
| Idaho fescue                    | FEID         | 2-5                                                                                        | 30-60    | 10-30    | 15-40              | 30-50    | 15-40    |
| Nevada bluegrass                | PONE3        | 2-5                                                                                        | ---      | ---      | 2-5                | ---      | 2-5      |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | ---      | ---      | T-10               | ---      | T-10     |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-10     | ---      | ---                | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 5-15     | ---                | 2-10     | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-5      | ---                | 2-5      | ---      |
| Other perennial grasses         | PPGG         | 5-10                                                                                       | ---      | 2-8      | 5-10               | 5-15     | 5-10     |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | 5-10               | ---      | 5-10     |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | 2-5      | 1-5                | ---      | 1-5      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| balsamroot                      | BALSA        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Other perennial forbs           | PPFF         | 2-5                                                                                        | ---      | 5-10     | 5-15               | 5-20     | 5-15     |
| Antelope bitterbrush            | PUTR2        | 2-15                                                                                       | ---      | ---      | 5-15               | 0-10     | 5-15     |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | ---      | ---      | 10-15              | ---      | 10-15    |
| Black sagebrush                 | ARARN        | ---                                                                                        | 10-20    | 15-25    | ---                | ---      | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 15-25    | ---                | 10-25    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 1-5      | ---                | ---      | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---      | 5-15               | 5-15     | 5-15     |
| Range site number               |              | 025X009N                                                                                   | 024X042N | 025X024N | 025X012N           | 025X017N | 025X012N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 1,300                                                                                      | 1,000    | 350      | 1,200              | 1,000    | 1,200    |
| Normal years                    |              | 900                                                                                        | 800      | 250      | 900                | 700      | 900      |
| Unfavorable years               |              | 700                                                                                        | 500      | 150      | 600                | 400      | 600      |

## 830--Reese silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Reese                                                                                      | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 5-15                                                                                       | 5-15               | T-5      | 40-60    |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | T-15     | 5-10     |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | 40-70    | 15-30    |
| Perennial forbs                 | PPFF         | T-5                                                                                        | T-5                | 2-8      | ---      |
| Black greasewood                | SAVE4        | 60-75                                                                                      | 60-75              | 2-5      | 5-15     |
| Iodinebush                      | ALOC2        | ---                                                                                        | ---                | 10-20    | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---                | 5-10     | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---                | ---      | 1-2      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---                | ---      | 1-2      |
| Range site number               |              | 024X011N                                                                                   | 024X011N           | 024X010N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 500                | 450      | 1,900    |
| Normal years                    |              | 350                                                                                        | 350                | 300      | 1,400    |
| Unfavorable years               |              | 200                                                                                        | 200                | 150      | 800      |

## 835--Reese-Ocala association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Reese                                                                                      | Ocala    | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 5-15                                                                                       | 5-15     | 5-15               | 40-60    | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10     | 5-10               | 5-10     | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---      | ---                | 15-30    | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---                | ---      | 5-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | ---      | T-10     |
| Perennial forbs                 | PPFF         | T-5                                                                                        | T-5      | T-5                | ---      | 2-8      |
| Black greasewood                | SAVE4        | 60-75                                                                                      | 60-75    | 60-75              | 5-15     | 15-30    |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---      | ---                | 1-2      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---                | 1-2      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---                | ---      | 30-50    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---                | ---      | 5-15     |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---                | ---      | 2-15     |
| Range site number               |              | 024X011N                                                                                   | 024X011N | 024X011N           | 024X007N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 500      | 500                | 1,900    | 600      |
| Normal years                    |              | 350                                                                                        | 350      | 350                | 1,400    | 450      |
| Unfavorable years               |              | 200                                                                                        | 200      | 200                | 800      | 300      |

## 841--Wendane Variant silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name        | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |
|--------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|
|                          |              | Soil name                                                                                  | Inclusion number-- |
|                          |              | Wendane Variant                                                                            | 1                  |
| Alkali sacaton           | SPAI         | 15-40                                                                                      | ---                |
| Alkali muhly             | MUAS         | 10-20                                                                                      | ---                |
| Alkali bluegrass         | POJU         | 5-15                                                                                       | ---                |
| Inland saltgrass         | DIST         | 5-10                                                                                       | ---                |
| Alkali cordgrass         | SPGR         | 5-10                                                                                       | ---                |
| Basin wildrye            | ELCI2        | 2-5                                                                                        | ---                |
| Bottlebrush squirreltail | SIHY         | ---                                                                                        | 5-15               |
| Indian ricegrass         | ORHY         | ---                                                                                        | 5-15               |
| Sandberg bluegrass       | POSE         | ---                                                                                        | 2-5                |
| Needleandthread          | STCO4        | ---                                                                                        | 1-3                |
| Arrowgrass               | TRIGL        | 1-3                                                                                        | ---                |
| Perennial forbs          | PPFF         | ---                                                                                        | 2-8                |
| Silver buffaloberry      | SHAR         | T-2                                                                                        | ---                |
| Willow                   | SALIX        | T-2                                                                                        | ---                |
| Rubber rabbitbrush       | CHNA2        | T-2                                                                                        | ---                |
| Black greasewood         | SAVE4        | T-2                                                                                        | ---                |
| Woods rose               | ROWO         | T-2                                                                                        | ---                |
| Shadscale                | ATCO         | ---                                                                                        | 30-40              |
| Bud sagebrush            | ARSP5        | ---                                                                                        | 20-30              |
| Spiny hopsage            | GRSP         | ---                                                                                        | 2-5                |
| Winterfat                | EULA5        | ---                                                                                        | 2-5                |

|                                 |          |          |
|---------------------------------|----------|----------|
| Range site number               | 024X009N | 024X002N |
| Potential production (lb/acre): |          |          |
| Favorable years                 | 1,500    | 700      |
| Normal years                    | 1,000    | 450      |
| Unfavorable years               | 700      | 300      |

## 850--Relley silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Relley                                                                                     | 1                  | 2        | 3        | 4        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-10     | 5-10     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | ---      | ---      | 10-20    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | ---      | ---      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | ---      | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | T-10     | T-10     | ---      |
| Perennial forbs                 | PFFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-50    | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 5-15     | 5-15     | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | ---      | ---      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | ---      | ---      | 60-70    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---                | 15-30    | 15-30    | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | 2-15     | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X003N | 024X003N | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 600      | 600      | 500      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      | 350      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      | 200      |

## 851--Relley silt loam, cemented substratum

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Relley                                                                                     | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      |



## 852--Relley silt loam, strongly saline

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Relley                                                                                     | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-15               | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15               | 10-20    |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | ---      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---                | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-40              | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | ---                | ---      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 20-30              | 2-5      |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---                | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | 60-70    |
| Range site number               |              | 024X003N                                                                                   | 024X002N           | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 600                                                                                        | 700                | 500      |
| Normal years                    |              | 450                                                                                        | 450                | 350      |
| Unfavorable years               |              | 300                                                                                        | 300                | 200      |

## 853--Relley silty clay loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |
|                                 |              | Relley                                                                                     | 1                  |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3                |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                |
| Range site number               |              | 024X002N                                                                                   | 024X002N           |
| Potential production (lb/acre): |              |                                                                                            |                    |
| Favorable years                 |              | 700                                                                                        | 700                |
| Normal years                    |              | 450                                                                                        | 450                |
| Unfavorable years               |              | 300                                                                                        | 300                |

## 855--Relley-Broyles association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Relley                                                                                     | Broyles  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 2-10     | 5-10               | 5-15     | 2-5      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---                | 5-15     | 2-10     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---                | 2-5      | 2-5      |
| Needleandthread                 | STC04        | 1-3                                                                                        | ---      | ---                | 1-3      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | ---      | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | T-10               | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | 1-4      | ---                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 1-4      | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | 2-8                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 2-5      | 30-50              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 5-15               | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---      | ---                | 2-5      | 15-30    |
| Winterfat                       | EULA5        | 2-5                                                                                        | 20-40    | ---                | 2-5      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | 15-30              | ---      | 2-10     |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | 2-15               | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | ---      | 15-25    |
| Anderson peachbrush             | PRAN2        | ---                                                                                        | ---      | ---                | ---      | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---                | ---      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X014N | 024X003N           | 024X002N | 024X041N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 400      | 600                | 700      | 1,000    |
| Normal years                    |              | 450                                                                                        | 300      | 450                | 450      | 800      |
| Unfavorable years               |              | 300                                                                                        | 200      | 300                | 300      | 600      |

## 861--Rixie silty clay loam, strongly saline

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Rixie                                                                                      | 1                  | 2        | 3        |
| Alkali sacaton                  | SPAI         | 15-40                                                                                      | 40-70              | 15-40    | 15-30    |
| Alkali muhly                    | MUAS         | 10-20                                                                                      | ---                | 10-20    | ---      |
| Alkali bluegrass                | POJU         | 5-15                                                                                       | ---                | 5-15     | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | T-15               | 5-10     | 5-10     |
| Alkali cordgrass                | SPGR         | 5-10                                                                                       | ---                | 5-10     | ---      |
| Basin wildrye                   | ELCI2        | 2-5                                                                                        | T-5                | 2-5      | 40-60    |
| Arrowgrass                      | TRIGL        | 1-3                                                                                        | ---                | 1-3      | ---      |
| Perennial forbs                 | PPFF         | ---                                                                                        | 2-8                | ---      | ---      |
| Silver buffaloberry             | SHAR         | T-2                                                                                        | ---                | T-2      | ---      |
| Willow                          | SALIX        | T-2                                                                                        | ---                | T-2      | ---      |
| Rubber rabbitbrush              | CHNA2        | T-2                                                                                        | ---                | T-2      | 1-2      |
| Black greasewood                | SAVE4        | T-2                                                                                        | 2-5                | T-2      | 5-15     |
| Woods rose                      | ROWO         | T-2                                                                                        | ---                | T-2      | ---      |
| Iodinebush                      | ALOC2        | ---                                                                                        | 10-20              | ---      | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | 5-10               | ---      | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---                | ---      | 1-2      |
| Range site number               |              | 024X009N                                                                                   | 024X010N           | 024X009N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,500                                                                                      | 450                | 1,500    | 1,900    |
| Normal years                    |              | 1,000                                                                                      | 300                | 1,000    | 1,400    |
| Unfavorable years               |              | 700                                                                                        | 150                | 700      | 800      |

## 862--Rixie silty clay loam, drained, strongly saline

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Rixie                                                                                      | 1                  | 2        | 3        | 4        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | 5-15               | ---      | 40-60    | ---      |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---                | ---      | 15-30    | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     | 5-10     |
| Wildrye                         | ELMYU        | ---                                                                                        | ---                | 30-60    | ---      | 30-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---                | 5-10     | ---      | 5-10     |
| Mat muhly                       | MURI         | ---                                                                                        | ---                | 2-10     | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | 5-15     | ---      | 5-15     |
| Sierra clover                   | TRWO         | ---                                                                                        | ---                | 2-5      | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | T-5                | 5-10     | ---      | 5-10     |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 60-75              | ---      | 5-15     | ---      |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      | 1-2      | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---                | ---      | 1-2      | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---                | 5-10     | ---      | 5-10     |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | 2-5      | ---      | 2-5      |
| Silver sagebrush                | ARCA13       | ---                                                                                        | ---                | 2-5      | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---                | 2-8      | ---      | 2-8      |
| Range site number               |              | 024X007N                                                                                   | 024X011N           | 025X001N | 024X007N | 025X001N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 1,900                                                                                      | 500                | 3,000    | 1,900    | 3,000    |
| Normal years                    |              | 1,400                                                                                      | 350                | 2,500    | 1,400    | 2,500    |
| Unfavorable years               |              | 800                                                                                        | 200                | 1,800    | 800      | 1,800    |

## 863--Rixie-Rixie, sodic, complex

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|--------------------|
|                                 |              | Soil name                                                                                  |              | Inclusion number-- |
|                                 |              | Rixie                                                                                      | Rixie, sodic | 1                  |
| Alkali sacaton                  | SPAI         | 15-40                                                                                      | 40-70        | 40-70              |
| Alkali muhly                    | MUAS         | 10-20                                                                                      | ---          | ---                |
| Alkali bluegrass                | POJU         | 5-15                                                                                       | ---          | ---                |
| Inland saltgrass                | DIST         | 5-10                                                                                       | T-15         | T-15               |
| Alkali cordgrass                | SPGR         | 5-10                                                                                       | ---          | ---                |
| Basin wildrye                   | ELCI2        | 2-5                                                                                        | T-5          | T-5                |
| Arrowgrass                      | TRIGL        | 1-3                                                                                        | ---          | ---                |
| Perennial forbs                 | PPFF         | ---                                                                                        | 2-8          | 2-8                |
| Silver buffaloberry             | SHAR         | T-2                                                                                        | ---          | ---                |
| Willow                          | SALIX        | T-2                                                                                        | ---          | ---                |
| Rubber rabbitbrush              | CHNA2        | T-2                                                                                        | ---          | ---                |
| Black greasewood                | SAVE4        | T-2                                                                                        | 2-5          | 2-5                |
| Woods rose                      | ROWO         | T-2                                                                                        | ---          | ---                |
| Iodinebush                      | ALOC2        | ---                                                                                        | 10-20        | 10-20              |
| Saltbush                        | ATRIP        | ---                                                                                        | 5-10         | 5-10               |
| Range site number               |              | 024X009N                                                                                   | 024X010N     | 024X010N           |
| Potential production (lb/acre): |              |                                                                                            |              |                    |
| Favorable years                 |              | 1,500                                                                                      | 450          | 450                |
| Normal years                    |              | 1,000                                                                                      | 300          | 300                |
| Unfavorable years               |              | 700                                                                                        | 150          | 150                |

## 864--Rixie silty clay loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Rixie                                                                                      | 1                  | 2        | 3        |
| Wildrye                         | ELMYU        | 30-60                                                                                      | 30-60              | 30-60    | ---      |
| Nevada bluegrass                | PONE3        | 5-10                                                                                       | 5-10               | 5-10     | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | 2-10               | 2-10     | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---                | ---      | 40-60    |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | ---      | 15-30    |
| Other perennial grasses         | PPGG         | 5-15                                                                                       | 5-15               | 5-15     | ---      |
| Sierra clover                   | TRWO         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 5-10               | 5-10     | ---      |
| Willow                          | SALIX        | 5-10                                                                                       | 5-10               | 5-10     | ---      |
| Basin big sagebrush             | ARTRT*       | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Silver sagebrush                | ARCA13       | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---                | ---      | 5-15     |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---                | ---      | 1-2      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---                | ---      | 1-2      |
| Other shrubs                    | SSSS         | 2-8                                                                                        | 2-8                | 2-8      | ---      |
| Range site number               |              | 025X001N                                                                                   | 025X001N           | 025X001N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 3,000                                                                                      | 3,000              | 3,000    | 1,900    |
| Normal years                    |              | 2,500                                                                                      | 2,500              | 2,500    | 1,400    |
| Unfavorable years               |              | 1,800                                                                                      | 1,800              | 1,800    | 800      |

## 870--Roca-Bregar-Linrose association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |          |
|                                 |              | Roca                                                                                       | Bregar   | Linrose  | 1                  | 2        | 3    | 4        |
| Bluebunch wheatgrass            | AGSP         | 40-60                                                                                      | ---      | 2-10     | ---                | 5-10     | ---  | 2-5      |
| Thurber needlegrass             | STTH2        | 5-10                                                                                       | ---      | ---      | ---                | ---      | ---  | 2-5      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---  | ---      |
| Basin wildrye                   | ELCI2        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---  | 10-20    |
| Idaho fescue                    | FEID         | ---                                                                                        | 10-20    | 30-60    | ---                | 30-60    | ---  | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10     | ---      | ---                | ---      | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-10     | ---      | ---                | ---      | ---  | 2-5      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 2-5      | 5-10     | ---                | 5-10     | ---  | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 5-10     |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | ---      | 2-5      | ---                | 1-3      | ---  | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---  | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---  | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | ---      | ---      | ---                | ---      | ---  | ---      |
| Mountain big sagebrush          | ARTRV        | T-5                                                                                        | ---      | ---      | ---                | 5-15     | ---  | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 5-15     | ---      | ---                | ---      | ---  | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | 5-15     | 10-20    | ---                | ---      | ---  | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 10-20    |
| Woods rose                      | ROWO         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 2-5      |
| Common chokecherry              | PRVI         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 2-5      |
| Green ephedra                   | EPVI         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 2-5      |
| Range site number               |              | 024X028N                                                                                   | 024X016N | 024X042N | None               | 024X023N | None | 028B006N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |          |
| Favorable years                 |              | 1,000                                                                                      | 350      | 1,000    | ---                | 1,500    | ---  | 1,000    |
| Normal years                    |              | 700                                                                                        | 250      | 800      | ---                | 1,200    | ---  | 600      |
| Unfavorable years               |              | 500                                                                                        | 150      | 500      | ---                | 900      | ---  | 400      |



## 872--Roca-Linrose-Wiskan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Roca                                                                                       | Linrose  | Wiskan   | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 40-60                                                                                      | 2-10     | 10-20    | 5-10               | 5-10     | ---      |
| Thurber needlegrass             | STTH2        | 5-10                                                                                       | ---      | 5-15     | ---                | 20-50    | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | 2-10     | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | 30-60    | ---      | 30-60              | ---      | 10-20    |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-10     | ---      | 5-10               | ---      | 2-5      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 2-10     | ---                | ---      | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | 2-5      | 1-3                | 2-4      | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| balsamroot                      | BALSA        | ---                                                                                        | ---      | ---      | ---                | 2-4      | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | ---      | ---      | ---                | 15-20    | ---      |
| Mountain big sagebrush          | ARTRV        | T-5                                                                                        | ---      | ---      | 5-15               | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | 10-20    | 15-30    | ---                | ---      | 5-15     |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      |
| Range site number               |              | 024X028N                                                                                   | 024X042N | 024X031N | 024X023N           | 024X005N | 024X016N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 1,000                                                                                      | 1,000    | 700      | 1,500              | 800      | 350      |
| Normal years                    |              | 700                                                                                        | 800      | 500      | 1,200              | 600      | 250      |
| Unfavorable years               |              | 500                                                                                        | 500      | 300      | 900                | 400      | 150      |

## 873--Roca-Reluctan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |      |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|------|----------|------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |      |          |      |
|                                 |              | Roca                                                                                       | Reluctan | 1                  | 2    | 3        | 4    |
| Bluebunch wheatgrass            | AGSP         | 40-60                                                                                      | 20-30    | 20-30              | ---  | ---      | ---  |
| Thurber needlegrass             | STTH2        | 5-10                                                                                       | 2-10     | 15-25              | ---  | ---      | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---                | ---  | ---      | ---  |
| Basin wildrye                   | ELCI2        | 2-5                                                                                        | 2-15     | ---                | ---  | 30-50    | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | 20-40    | ---                | ---  | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 2-10               | ---  | 5-10     | ---  |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---                | ---  | 5-10     | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 10-15              | ---  | 5-15     | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 1-5      | 2-5                | ---  | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 1-5      | 2-5                | ---  | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-5                | ---  | 5-10     | ---  |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | ---      | ---                | ---  | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | ---      | ---                | ---  | ---      | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | 10-15              | ---  | ---      | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | ---  | 5-10     | ---  |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---                | ---  | 2-5      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 5-10               | ---  | 5-10     | ---  |
| Range site number               |              | 024X028N                                                                                   | 024X021N | 025X014N           | None | 028B024N | None |
| Potential production (lb/acre): |              |                                                                                            |          |                    |      |          |      |
| Favorable years                 |              | 1,000                                                                                      | 1,400    | 1,000              | ---  | 2,800    | ---  |
| Normal years                    |              | 700                                                                                        | 1,000    | 800                | ---  | 1,700    | ---  |
| Unfavorable years               |              | 500                                                                                        | 700      | 600                | ---  | 1,000    | ---  |

## 875--Roca-Glean-Bregar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |
|                                 |              | Roca                                                                                       | Glean    | Bregar   | 1                  | 2        | 3    |
| Bluebunch wheatgrass            | AGSP         | 40-60                                                                                      | 5-10     | ---      | 20-50              | ---      | ---  |
| Thurber needlegrass             | STTH2        | 5-10                                                                                       | ---      | ---      | 2-5                | ---      | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---  |
| Basin wildrye                   | ELCI2        | 2-5                                                                                        | ---      | ---      | 5-10               | ---      | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | 30-60    | 10-20    | 1-10               | ---      | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-10     | 2-5      | ---                | ---      | ---  |
| Mountain brome                  | BRMA4        | ---                                                                                        | 2-5      | ---      | 2-15               | ---      | ---  |
| Sedge                           | CAREX        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10     | 2-5                | 5-15     | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | ---                | 2-5      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | ---                | 1-3      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 1-3      | ---      | 2-5                | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | 2-5                | ---      | ---  |
| Lupine                          | LUPIN        | ---                                                                                        | 1-2      | ---      | ---                | ---      | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 2-8      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | ---      | ---      | ---                | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | 5-15     | ---      | 5-15               | ---      | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | 30-40    | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | ---                | 20-30    | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  |
| Range site number               |              | 024X028N                                                                                   | 024X023N | 024X016N | 024X029N           | 024X002N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |
| Favorable years                 |              | 1,000                                                                                      | 1,500    | 350      | 1,500              | 700      | ---  |
| Normal years                    |              | 700                                                                                        | 1,200    | 250      | 1,100              | 450      | ---  |
| Unfavorable years               |              | 500                                                                                        | 900      | 150      | 800                | 300      | ---  |

## 881--Rose Creek silt loam, drained, strongly saline

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Rose Creek                                                                                 | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | 40-60              | 40-60    | 40-60    |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | 15-30              | 15-30    | 15-30    |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | 1-2                | 1-2      | 1-2      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | 1-2                | 1-2      | 1-2      |
| Range site number               |              | 024X007N                                                                                   | 024X007N           | 024X007N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,900                                                                                      | 1,900              | 1,900    | 1,900    |
| Normal years                    |              | 1,400                                                                                      | 1,400              | 1,400    | 1,400    |
| Unfavorable years               |              | 800                                                                                        | 800                | 800      | 800      |

## 882--Rose Creek silty clay loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Rose Creek                                                                                 | 1                  | 2        | 3        |
| Wildrye                         | ELMYU        | 30-60                                                                                      | 30-60              | 30-60    | 30-60    |
| Nevada bluegrass                | PONE3        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | 2-10               | 2-10     | 2-10     |
| Other perennial grasses         | PPGG         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sierra clover                   | TRWO         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Willow                          | SALIX        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Basin big sagebrush             | ARTRT*       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Silver sagebrush                | ARCA13       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other shrubs                    | SSSS         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Range site number               |              | O25X001N                                                                                   | O25X001N           | O25X001N | O25X001N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 3,000                                                                                      | 3,000              | 3,000    | 3,000    |
| Normal years                    |              | 2,500                                                                                      | 2,500              | 2,500    | 2,500    |
| Unfavorable years               |              | 1,800                                                                                      | 1,800              | 1,800    | 1,800    |

## 883--Rose Creek-Paranat silty clay loams

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Rose Creek                                                                                 | Paranat  | 1                  | 2        |
| Wildrye                         | ELMYU        | 30-60                                                                                      | 30-60    | 30-60              | 30-60    |
| Nevada bluegrass                | PONE3        | 5-10                                                                                       | 5-10     | 5-10               | 5-10     |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10     | 5-10               | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | 2-10     | 2-10               | 2-10     |
| Other perennial grasses         | PPGG         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     |
| Sierra clover                   | TRWO         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 5-10     | 5-10               | 5-10     |
| Willow                          | SALIX        | 5-10                                                                                       | 5-10     | 5-10               | 5-10     |
| Basin big sagebrush             | ARTRT*       | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Silver sagebrush                | ARCA13       | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Other shrubs                    | SSSS         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      |
| Range site number               |              | 025X001N                                                                                   | 025X001N | 025X001N           | 025X001N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 3,000                                                                                      | 3,000    | 3,000              | 3,000    |
| Normal years                    |              | 2,500                                                                                      | 2,500    | 2,500              | 2,500    |
| Unfavorable years               |              | 1,800                                                                                      | 1,800    | 1,800              | 1,800    |

## 891--Rosney loam, cemented substratum

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Rosney                                                                                     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---                | 5-10     | 5-10     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 5-15               | ---      | ---      |
| Inland saltgrass                | DIST         | ---                                                                                        | 5-10               | ---      | ---      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---                | T-10     | T-10     |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | T-5                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | ---                | 30-50    | 30-50    |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 60-75              | 15-30    | 15-30    |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | ---                | 5-15     | 5-15     |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---                | 2-15     | 2-15     |
| Range site number               |              | 024X003N                                                                                   | 024X011N           | 024X003N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 600                                                                                        | 500                | 600      | 600      |
| Normal years                    |              | 450                                                                                        | 350                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 200                | 300      | 300      |

## 892--Rosney silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Rosney                                                                                     | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-30                                                                                      | ---                | 10-30    | ---      |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Alkali sacaton                  | SPAI         | T-5                                                                                        | ---                | T-5      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10               | ---      | T-10     |
| Perennial forbs                 | PPFF         | T-5                                                                                        | 2-8                | T-5      | 2-8      |
| Saltbush                        | ATRIP        | 50-65                                                                                      | ---                | 50-65    | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-50              | ---      | 30-50    |
| Black greasewood                | SAVE4        | ---                                                                                        | 15-30              | ---      | 15-30    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 5-15               | ---      | 5-15     |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15               | ---      | 2-15     |
| Range site number               |              | 024X012N                                                                                   | 024X003N           | 024X012N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 600                | 700      | 600      |
| Normal years                    |              | 400                                                                                        | 450                | 400      | 450      |
| Unfavorable years               |              | 200                                                                                        | 300                | 200      | 300      |



970--Soolake very fine sandy loam, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Soolake                                                                                    | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-15               | 5-10     | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15               | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | ---      | ---      |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---                | T-10     | T-10     |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-40              | 30-50    | 30-50    |
| Black greasewood                | SAVE4        | 15-30                                                                                      | ---                | 15-30    | 15-30    |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 20-30              | 5-15     | 5-15     |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---                | 2-15     | 2-15     |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5                | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | ---      | ---      |
| Range site number               |              | 024X003N                                                                                   | 024X002N           | 024X003N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 600                                                                                        | 700                | 600      | 600      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

## 971--Soolake very fine sandy loam, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |
|                                 |              | Soolake                                                                                    | 1                  |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-15               |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15               |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---                |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-40              |
| Black greasewood                | SAVE4        | 15-30                                                                                      | ---                |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 20-30              |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---                |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5                |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                |
| Range site number               |              | 024X003N                                                                                   | 024X002N           |
| Potential production (lb/acre): |              |                                                                                            |                    |
| Favorable years                 |              | 600                                                                                        | 700                |
| Normal years                    |              | 450                                                                                        | 450                |
| Unfavorable years               |              | 300                                                                                        | 300                |

## 972--Soolake-Dunphy-Argenta association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Soolake                                                                                    | Dunphy   | Argenta  | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---      | ---      | ---                | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 5-15     | 5-15     | 40-60              | 2-10     |
| Inland saltgrass                | DIST         | ---                                                                                        | 5-10     | 5-10     | 5-10               | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---      | ---      | 15-30              | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | 20-40    |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | ---                | 5-15     |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | ---      | ---      | ---                | 2-10     |
| Other perennial grasses         | PPGG         | T-10                                                                                       | ---      | ---      | ---                | ---      |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | ---      | ---      | ---                | 2-4      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | T-5      | T-5      | ---                | ---      |
| Shadscale                       | ATCO         | 30-50                                                                                      | ---      | ---      | ---                | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 60-75    | 60-75    | 5-15               | 2-8      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | ---      | ---      | ---                | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | ---      | ---      | ---                | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---      | ---      | 1-2                | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | 1-2                | 1-5      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 10-20    |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | ---                | 5-10     |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---      | ---                | 2-10     |
| Hairy horsebrush                | TECO2        | ---                                                                                        | ---      | ---      | ---                | 5-8      |
| Range site number               |              | 024X003N                                                                                   | 024X011N | 024X011N | 024X007N           | 024X001N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 600                                                                                        | 500      | 500      | 1,900              | 800      |
| Normal years                    |              | 450                                                                                        | 350      | 350      | 1,400              | 500      |
| Unfavorable years               |              | 300                                                                                        | 200      | 200      | 800                | 300      |

## 980--Sombrero very fine sandy loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Sombrero                                                                                   | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | T-5                | 5-15     | 40-60    |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | 40-70              | ---      | 15-30    |
| Inland saltgrass                | DIST         | 5-10                                                                                       | T-15               | 5-10     | 5-10     |
| Perennial forbs                 | PPFF         | ---                                                                                        | 2-8                | T-5      | ---      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 2-5                | 60-75    | 5-15     |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      | 1-2      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---                | ---      | 1-2      |
| Iodinebush                      | ALOC2        | ---                                                                                        | 10-20              | ---      | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | 5-10               | ---      | ---      |
| Range site number               |              | 024X007N                                                                                   | 024X010N           | 024X011N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,900                                                                                      | 450                | 500      | 1,900    |
| Normal years                    |              | 1,400                                                                                      | 300                | 350      | 1,400    |
| Unfavorable years               |              | 800                                                                                        | 150                | 200      | 800      |

## 990--Sonoma silt loam, drained

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Sonoma                                                                                     | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | 50-60              | 50-60    |
| Nevada bluegrass                | PONE3        | 5-15                                                                                       | ---                | 5-15     |
| Mat muhly                       | MURI         | 2-10                                                                                       | ---                | 2-10     |
| Sedge                           | CAREX        | 1-5                                                                                        | ---                | 1-5      |
| Western wheatgrass              | AGSM         | ---                                                                                        | 5-15               | ---      |
| Other perennial grasses         | PPGG         | 15-20                                                                                      | ---                | 15-20    |
| Perennial forbs                 | PPFF         | 5-10                                                                                       | 2-8                | 5-10     |
| Basin big sagebrush             | ARTRT*       | 10-15                                                                                      | 15-20              | 10-15    |
| Black greasewood                | SAVE4        | ---                                                                                        | 2-10               | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 2-5                | ---      |
| Other shrubs                    | SSSS         | 2-5                                                                                        | ---                | 2-5      |
| Range site number               |              | 025X003N                                                                                   | 024X006N           | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 2,500                                                                                      | 1,500              | 2,500    |
| Normal years                    |              | 2,900                                                                                      | 1,100              | 1,900    |
| Unfavorable years               |              | 2,200                                                                                      | 600                | 1,200    |

## 991--Sonoma silt loam, drained, slightly saline

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Sonoma                                                                                     | 1                  | 2        | 3        |
| Basin wildrye                   | ELC12        | 40-60                                                                                      | ---                | ---      | 40-60    |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---                | ---      | 15-30    |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | ---      | 5-10     |
| Wildrye                         | ELMYU        | ---                                                                                        | 30-60              | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 5-10               | ---      | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | 2-10               | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | 5-10     | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-15               | T-10     | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | 2-5                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 5-10               | 2-8      | ---      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | ---                | 15-30    | 5-15     |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      | 1-2      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---                | ---      | 1-2      |
| Willow                          | SALIX        | ---                                                                                        | 5-10               | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 2-5                | ---      | ---      |
| Silver sagebrush                | ARCA13       | ---                                                                                        | 2-5                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | 5-15     | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-8                | ---      | ---      |
| Range site number               |              | 024X007N                                                                                   | 025X001N           | 024X003N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,900                                                                                      | 3,000              | 600      | 1,900    |
| Normal years                    |              | 1,400                                                                                      | 2,500              | 450      | 1,400    |
| Unfavorable years               |              | 800                                                                                        | 1,800              | 300      | 800      |

992--Sonoma silt loam, strongly saline, rarely flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Sonoma                                                                                     | 1                  | 2        | 3        | 4        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | ---                | ---      | ---      | 40-60    |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---                | ---      | ---      | 15-30    |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | ---      | 5-10     | 5-10     |
| Wildrye                         | ELMYU        | ---                                                                                        | 30-60              | ---      | 30-60    | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 5-10               | ---      | 5-10     | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | 2-10               | ---      | 2-10     | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | 5-10     | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-15               | T-10     | 5-15     | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | 2-5                | ---      | 2-5      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 5-10               | 2-8      | 5-10     | ---      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | ---                | 15-30    | ---      | 5-15     |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      | ---      | 1-2      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---                | ---      | ---      | 1-2      |
| Willow                          | SALIX        | ---                                                                                        | 5-10               | ---      | 5-10     | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 2-5                | ---      | 2-5      | ---      |
| Silver sagebrush                | ARCA13       | ---                                                                                        | 2-5                | ---      | 2-5      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 30-50    | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | 5-15     | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | ---      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-8                | ---      | 2-8      | ---      |
| Range site number               |              | 024X007N                                                                                   | 025X001N           | 024X003N | 025X001N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 1,900                                                                                      | 3,000              | 600      | 3,000    | 1,900    |
| Normal years                    |              | 1,400                                                                                      | 2,500              | 450      | 2,500    | 1,400    |
| Unfavorable years               |              | 800                                                                                        | 1,800              | 300      | 1,800    | 800      |

## 993--Sonoma silty clay loam, frequently flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Sonoma                                                                                     | 1                  | 2        | 3        |
| Wildrye                         | ELMYU        | 30-60                                                                                      | 30-60              | 30-60    | 30-60    |
| Nevada bluegrass                | PONE3        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | 2-10               | 2-10     | 2-10     |
| Other perennial grasses         | PPGG         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sierra clover                   | TRWO         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Willow                          | SALIX        | 5-10                                                                                       | 5-10               | 5-10     | 5-10     |
| Basin big sagebrush             | ARTRT*       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Silver sagebrush                | ARCA13       | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Other shrubs                    | SSSS         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Range site number               |              | 025X001N                                                                                   | 025X001N           | 025X001N | 025X001N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 3,000                                                                                      | 3,000              | 3,000    | 3,000    |
| Normal years                    |              | 2,500                                                                                      | 2,500              | 2,500    | 2,500    |
| Unfavorable years               |              | 1,800                                                                                      | 1,800              | 1,800    | 1,800    |



994--Sonoma silty clay loam, drained, strongly saline, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              |                                                                                            | 1                  | 2        | 3        | 4        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | T-5                | ---      | 2-5      | 40-60    |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | 40-70              | ---      | 15-40    | 15-30    |
| Inland saltgrass                | DIST         | 5-10                                                                                       | T-15               | ---      | 5-10     | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | 5-10     | ---      | ---      |
| Alkali muhly                    | MUAS         | ---                                                                                        | ---                | ---      | 10-20    | ---      |
| Alkali bluegrass                | POJU         | ---                                                                                        | ---                | ---      | 5-15     | ---      |
| Alkali cordgrass                | SPGR         | ---                                                                                        | ---                | ---      | 5-10     | ---      |
| Arrowgrass                      | TRIGL        | ---                                                                                        | ---                | ---      | 1-3      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | T-10     | ---      | ---      |
| Perennial forbs                 | PPFF         | ---                                                                                        | 2-8                | 2-8      | ---      | ---      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 2-5                | 15-30    | T-2      | 5-15     |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      | ---      | 1-2      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---                | ---      | T-2      | 1-2      |
| Iodinebush                      | ALOC2        | ---                                                                                        | 10-20              | ---      | ---      | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | 5-10               | ---      | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 30-50    | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | 5-15     | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | ---      | ---      |
| Silver buffaloberry             | SHAR         | ---                                                                                        | ---                | ---      | T-2      | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---                | ---      | T-2      | ---      |
| Woods rose                      | ROWO         | ---                                                                                        | ---                | ---      | T-2      | ---      |
| Range site number               |              | 024X007N                                                                                   | 024X010N           | 024X003N | 024X009N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 1,900                                                                                      | 450                | 600      | 1,500    | 1,900    |
| Normal years                    |              | 1,400                                                                                      | 300                | 450      | 1,000    | 1,400    |
| Unfavorable years               |              | 800                                                                                        | 150                | 300      | 700      | 800      |

995--Sonoma silty clay loam, strongly saline, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Sonoma                                                                                     | 1                  | 2        | 3        |
| Alkali sacaton                  | SPAI         | 15-40                                                                                      | ---                | 40-70    | 15-40    |
| Alkali muhly                    | MUAS         | 10-20                                                                                      | ---                | ---      | 10-20    |
| Alkali bluegrass                | POJU         | 5-15                                                                                       | ---                | ---      | 5-15     |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | T-15     | 5-10     |
| Alkali cordgrass                | SPGR         | 5-10                                                                                       | ---                | ---      | 5-10     |
| Basin wildrye                   | ELCI2        | 2-5                                                                                        | ---                | T-5      | 2-5      |
| Wildrye                         | ELMYU        | ---                                                                                        | 30-60              | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 5-10               | ---      | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | 2-10               | ---      | ---      |
| Arrowgrass                      | TRIGL        | 1-3                                                                                        | ---                | ---      | 1-3      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-15               | ---      | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | 2-5                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 5-10               | 2-8      | ---      |
| Silver buffaloberry             | SHAR         | T-2                                                                                        | ---                | ---      | T-2      |
| Willow                          | SALIX        | T-2                                                                                        | 5-10               | ---      | T-2      |
| Rubber rabbitbrush              | CHNA2        | T-2                                                                                        | ---                | ---      | T-2      |
| Black greasewood                | SAVE4        | T-2                                                                                        | ---                | 2-5      | T-2      |
| Woods rose                      | ROWO         | T-2                                                                                        | ---                | ---      | T-2      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 2-5                | ---      | ---      |
| Silver sagebrush                | ARCA13       | ---                                                                                        | 2-5                | ---      | ---      |
| Iodinebush                      | ALOC2        | ---                                                                                        | ---                | 10-20    | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---                | 5-10     | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-8                | ---      | ---      |
| Range site number               |              | 024X009N                                                                                   | 025X001N           | 024X010N | 024X009N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,500                                                                                      | 3,000              | 450      | 1,500    |
| Normal years                    |              | 1,000                                                                                      | 2,500              | 300      | 1,000    |
| Unfavorable years               |              | 700                                                                                        | 1,800              | 150      | 700      |

## 996--Sonoma, strongly saline-Sonoma complex

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                         |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  |                         | Inclusion number-- |          |
|                                 |              | Sonoma                                                                                     | Sonoma, strongly saline | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | 2-5                     | 40-60              | 5-15     |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | 15-40                   | 15-30              | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10                    | 5-10               | 5-10     |
| Alkali muhly                    | MUAS         | ---                                                                                        | 10-20                   | ---                | ---      |
| Alkali bluegrass                | POJU         | ---                                                                                        | 5-15                    | ---                | ---      |
| Alkali cordgrass                | SPGR         | ---                                                                                        | 5-10                    | ---                | ---      |
| Arrowgrass                      | TRIGL        | ---                                                                                        | 1-3                     | ---                | ---      |
| Perennial forbs                 | PPFF         | ---                                                                                        | ---                     | ---                | T-5      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | T-2                     | 5-15               | 60-75    |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                     | 1-2                | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | T-2                     | 1-2                | ---      |
| Silver buffaloberry             | SHAR         | ---                                                                                        | T-2                     | ---                | ---      |
| Willow                          | SALIX        | ---                                                                                        | T-2                     | ---                | ---      |
| Woods rose                      | ROWO         | ---                                                                                        | T-2                     | ---                | ---      |
| Range site number               |              | 024X007N                                                                                   | 024X009N                | 024X007N           | 024X011N |
| Potential production (lb/acre): |              |                                                                                            |                         |                    |          |
| Favorable years                 |              | 1,900                                                                                      | 1,500                   | 1,900              | 500      |
| Normal years                    |              | 1,400                                                                                      | 1,000                   | 1,400              | 350      |
| Unfavorable years               |              | 800                                                                                        | 700                     | 800                | 200      |

997--Sonoma silty clay loam, strongly saline, frequently flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Sonoma                                                                                     | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | 50-60              | 5-15     |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---                | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | ---                | 5-10     |
| Western wheatgrass              | AGSM         | ---                                                                                        | 5-15               | ---      |
| Perennial forbs                 | PPFF         | ---                                                                                        | 2-8                | T-5      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 2-10               | 60-75    |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | 2-5                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 15-20              | ---      |
| Range site number               |              | 024X007N                                                                                   | 024X006N           | 024X011N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 1,900                                                                                      | 1,500              | 500      |
| Normal years                    |              | 1,400                                                                                      | 1,100              | 350      |
| Unfavorable years               |              | 800                                                                                        | 600                | 200      |

## 1021--Susie Creek-Millerlux association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |           | Inclusion number-- |      |          |
|                                 |              | Susie Creek                                                                                | Millerlux | 1                  | 2    | 3        |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | 15-20     | 20-30              | ---  | 15-30    |
| Thurber needlegrass             | STTH2        | 15-25                                                                                      | 15-20     | 15-25              | ---  | 2-10     |
| Nevada bluegrass                | PONE3        | 2-10                                                                                       | ---       | 2-10               | ---  | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10      | ---                | ---  | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 5-8       | ---                | ---  | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | 5-8       | ---                | ---  | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-8       | ---                | ---  | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | ---       | ---                | ---  | 25-50    |
| Spike fescue                    | HEKI         | ---                                                                                        | ---       | ---                | ---  | 2-10     |
| Other perennial grasses         | PPGG         | 10-15                                                                                      | ---       | 10-15              | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | ---       | 2-5                | ---  | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---       | 2-5                | ---  | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5       | ---                | ---  | 2-5      |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-3       | ---                | ---  | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 1-3       | ---                | ---  | ---      |
| Other perennial forbs           | PPFF         | 2-5                                                                                        | ---       | 2-5                | ---  | ---      |
| Big sagebrush                   | ARTR2        | 10-15                                                                                      | ---       | 10-15              | ---  | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 20-30     | ---                | ---  | 10-20    |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---       | ---                | ---  | 2-5      |
| Other shrubs                    | SSSS         | 5-10                                                                                       | ---       | 5-10               | ---  | ---      |
| Range site number               |              | 025X014N                                                                                   | 024X018N  | 025X014N           | None | 024X027N |
| Potential production (lb/acre): |              |                                                                                            |           |                    |      |          |
| Favorable years                 |              | 1,000                                                                                      | 700       | 1,000              | ---  | 1,200    |
| Normal years                    |              | 800                                                                                        | 500       | 800                | ---  | 800      |
| Unfavorable years               |              | 600                                                                                        | 300       | 600                | ---  | 600      |

## 1031--Teman silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Teman                                                                                      | 1                  | 2        | 3        | 4        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | ---                | 2-10     | ---      | ---      |
| Western wheatgrass              | AGSM         | 5-15                                                                                       | ---                | ---      | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15               | ---      | 5-10     | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15               | 20-40    | 10-30    | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | ---      | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | 5-15     | ---      | ---      |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | ---                | 2-10     | ---      | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | ---      | T-5      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | ---      | ---      | T-10     |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | ---                | 2-5      | ---      | ---      |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | ---                | 2-4      | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8                | ---      | T-5      | 2-8      |
| Basin big sagebrush             | ARTRT*       | 15-20                                                                                      | ---                | 10-20    | ---      | ---      |
| Black greasewood                | SAVE4        | 2-10                                                                                       | ---                | 2-8      | ---      | 15-30    |
| Rubber rabbitbrush              | CHNA2        | 2-5                                                                                        | ---                | 1-5      | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40              | ---      | ---      | 30-50    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30              | ---      | ---      | 5-15     |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5                | 5-10     | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | ---      | ---      | ---      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---                | 2-10     | ---      | ---      |
| Hairy horsebrush                | TECO2        | ---                                                                                        | ---                | 5-8      | ---      | ---      |
| Saltbush                        | ATRIIP       | ---                                                                                        | ---                | ---      | 50-65    | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | ---      | ---      | 2-15     |
| Range site number               |              | 024X006N                                                                                   | 024X002N           | 024X001N | 024X012N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 1,500                                                                                      | 700                | 800      | 700      | 600      |
| Normal years                    |              | 1,100                                                                                      | 450                | 500      | 400      | 450      |
| Unfavorable years               |              | 600                                                                                        | 300                | 300      | 200      | 300      |

## 1032--Teman silt loam, clayey substratum

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Teman                                                                                      | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | 2-10               | ---      | T-5      |
| Western wheatgrass              | AGSM         | 5-15                                                                                       | ---                | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 20-40              | 10-30    | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 5-15               | ---      | ---      |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | 2-10               | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | 5-10     | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | T-5      | 40-70    |
| Inland saltgrass                | DIST         | ---                                                                                        | ---                | ---      | T-15     |
| Lemon scurfpea                  | PSLA         | ---                                                                                        | 2-5                | ---      | ---      |
| Tufted eveningprimrose          | OECA         | ---                                                                                        | 2-4                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---                | T-5      | 2-8      |
| Basin big sagebrush             | ARTRT*       | 15-20                                                                                      | 10-20              | ---      | ---      |
| Black greasewood                | SAVE4        | 2-10                                                                                       | 2-8                | ---      | 2-5      |
| Rubber rabbitbrush              | CHNA2        | 2-5                                                                                        | 1-5                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 5-10               | ---      | ---      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | 2-10               | ---      | ---      |
| Hairy horsebrush                | TECO2        | ---                                                                                        | 5-8                | ---      | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---                | 50-65    | 5-10     |
| Iodinebush                      | ALOC2        | ---                                                                                        | ---                | ---      | 10-20    |
| Range site number               |              | 024X006N                                                                                   | 024X001N           | 024X012N | 024X010N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,500                                                                                      | 800                | 700      | 450      |
| Normal years                    |              | 1,100                                                                                      | 500                | 400      | 300      |
| Unfavorable years               |              | 600                                                                                        | 300                | 200      | 150      |

## 1033--Teman silt loam, strongly saline

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Teman                                                                                      | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | ---                | ---      | ---      |
| Western wheatgrass              | AGSM         | 5-15                                                                                       | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-10               | 5-15     | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---                | 5-15     | 10-30    |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---                | 1-3      | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---                | ---      | T-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10               | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | T-5      |
| Basin big sagebrush             | ARTRT*       | 15-20                                                                                      | ---                | ---      | ---      |
| Black greasewood                | SAVE4        | 2-10                                                                                       | 15-30              | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | 2-5                                                                                        | ---                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-50              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 5-15               | 20-30    | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15               | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---                | 2-5      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---                | 2-5      | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---                | ---      | 50-65    |
| Range site number               |              | 024X006N                                                                                   | 024X003N           | 024X002N | 024X012N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,500                                                                                      | 600                | 700      | 700      |
| Normal years                    |              | 1,100                                                                                      | 450                | 450      | 400      |
| Unfavorable years               |              | 600                                                                                        | 300                | 300      | 200      |



## 1040--Tenabo, gravelly-Allor-Tenabo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Tenabo, gravelly                                                                           | Allor    | Tenabo   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | 5-15     | 5-15               | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | 5-15     | 5-15               | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | 2-5      | 2-5                | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | 1-3      | 1-3                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | ---      | ---                | 20-50    |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---      | ---                | 5-10     |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---      | ---                | 2-4      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---      | ---                | 2-4      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | 2-8      | 2-8                | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | 30-40    | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | 20-30    | 20-30              | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | 2-5      | 2-5                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---      | ---                | 15-20    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---      | ---                | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---      | ---                | 2-10     |
| Range site number               |              | 024X002N                                                                                   | 024X005N | 024X002N | 024X002N           | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 800      | 700      | 700                | 800      |
| Normal years                    |              | 450                                                                                        | 600      | 450      | 450                | 600      |
| Unfavorable years               |              | 300                                                                                        | 400      | 300      | 300                | 400      |

## 1041--Tenabo-Ricert association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Tenabo                                                                                     | Ricert   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3      | 1-3                | 1-3      | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40              | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30              | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      | 300      |

1042--Tenabo very gravelly loam, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Tenabo                                                                                     | 1                  | 2        | 3        | 4        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---                | 5-15     | 2-10     | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---                | 5-15     | 5-15     | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---                | 2-5      | 2-10     | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---                | 1-3      | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 15-25              | ---      | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 15-25              | ---      | 10-20    | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---                | ---      | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---                | ---      | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---                | ---      | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---                | ---      | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-20              | ---      | ---      | 15-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5                | ---      | 1-2      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5                | ---      | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | ---      | 1-2      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | ---      | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-10               | 2-8      | ---      | 5-10     |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---                | 30-40    | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---                | 20-30    | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---                | 2-5      | 5-15     | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---                | 2-5      | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 5-10               | ---      | 30-35    | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-10               | ---      | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | ---      | ---      | 10-15    |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10               | ---      | ---      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X035N           | 024X002N | 024X020N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 500                | 700      | 700      | 2,500    |
| Normal years                    |              | 450                                                                                        | 400                | 450      | 450      | 1,900    |
| Unfavorable years               |              | 300                                                                                        | 250                | 300      | 300      | 1,200    |

## 1062--Tomera-Snapp-Whirlo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Tomera                                                                                     | Snapp    | Whirlo   | 1                  | 2        |
| Thurber needlegrass             | STH2         | 20-50                                                                                      | 20-50    | ---      | 10-20              | 20-50    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---      | ---                | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-15     | 2-10               | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 5-15     | 5-15               | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | 2-10               | ---      |
| Needleandthread                 | STC04        | ---                                                                                        | ---      | 1-3      | ---                | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---      | ---                | 2-4      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---      | 1-2                | 2-4      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---      | 30-35              | 15-20    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---      | ---                | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---      | 5-15               | 2-5      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40    | ---                | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30    | ---                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5      | ---                | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---      | ---                | 2-10     |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X002N | 024X020N           | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | 700      | 700                | 800      |
| Normal years                    |              | 600                                                                                        | 600      | 450      | 450                | 600      |
| Unfavorable years               |              | 400                                                                                        | 400      | 300      | 300                | 400      |

## 1080--Trunk-Burrita association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |      |          |
|                                 |              | Trunk                                                                                      | Burrita  | 1                  | 2    | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---                | ---  | 10-20    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---                | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-15               | ---  | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 5-15               | ---  | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5                | ---  | 2-10     |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3                | ---  | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---                | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---                | ---  | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | ---  | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | ---  | 1-2      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8                | ---  | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---                | ---  | 30-35    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---                | ---  | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | ---  | 5-15     |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40              | ---  | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30              | ---  | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5                | ---  | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---                | ---  | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X002N           | None | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |      |          |
| Favorable years                 |              | 800                                                                                        | 800      | 700                | ---  | 700      |
| Normal years                    |              | 600                                                                                        | 600      | 450                | ---  | 450      |
| Unfavorable years               |              | 400                                                                                        | 400      | 300                | ---  | 300      |

## 1082--Trunk-Reina association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |      |
|                                 |              | Trunk                                                                                      | Reina    | 1                  | 2    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---                | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---                | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---                | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---                | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---                | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---                | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---                | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---                | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X005N | None               | None |
| Potential production (lb/acre): |              |                                                                                            |          |                    |      |
| Favorable years                 |              | 800                                                                                        | 800      | ---                | ---  |
| Normal years                    |              | 600                                                                                        | 600      | ---                | ---  |
| Unfavorable years               |              | 400                                                                                        | 400      | ---                | ---  |

## 1084--Trunk-Burrita-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |          |
|                                 |              | Trunk                                                                                      | Burrita  | Rock outcrop | 1                  | 2        | 3        | 4        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---          | 15-20              | 20-50    | 20-50    | 2-5      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---          | 15-20              | 5-10     | 5-10     | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---          | 5-10               | ---      | ---      | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---          | 5-8                | ---      | ---      | 2-5      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---          | 5-8                | ---      | ---      | 2-5      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---          | 5-8                | ---      | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-10     |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-5      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---          | 2-5                | 2-4      | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---          | ---                | 2-4      | 2-4      | ---      |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | ---          | 1-3                | ---      | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---          | 1-3                | ---      | ---      | ---      |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 1-2      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---          | ---                | 15-20    | 15-20    | 10-25    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---          | ---                | 2-5      | 2-5      | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---          | ---                | 2-5      | 2-5      | 5-15     |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | ---          | 20-30              | ---      | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 10-25    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---          | ---                | 2-10     | 2-10     | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | None         | 024X018N           | 024X005N | 024X005N | 024X026N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | ---          | 700                | 800      | 800      | 400      |
| Normal years                    |              | 600                                                                                        | 600      | ---          | 500                | 600      | 600      | 300      |
| Unfavorable years               |              | 400                                                                                        | 400      | ---          | 300                | 400      | 400      | 200      |

## 1085--Trunk-Dewar-Stingdorn association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |           |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|-----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |           | Inclusion number-- |          |          |      |
|                                 |              | Trunk                                                                                      | Dewar    | Stingdorn | 1                  | 2        | 3        | 4    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---       | 20-50              | 20-50    | 20-50    | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---       | 5-10               | 5-10     | 5-10     | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-15      | ---                | ---      | ---      | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 5-15      | ---                | ---      | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5       | ---                | ---      | ---      | ---  |
| Needleandthread                 | STC04        | ---                                                                                        | ---      | 1-3       | ---                | ---      | ---      | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---       | 2-4                | 2-4      | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---       | 2-4                | 2-4      | 2-4      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8       | ---                | ---      | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---       | 15-20              | 15-20    | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---       | 2-5                | 2-5      | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5       | 2-5                | 2-5      | 2-5      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40     | ---                | ---      | ---      | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30     | ---                | ---      | ---      | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5       | ---                | ---      | ---      | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---       | 2-10               | 2-10     | 2-10     | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X002N  | 024X005N           | 024X005N | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |           |                    |          |          |      |
| Favorable years                 |              | 800                                                                                        | 800      | 700       | 800                | 800      | 800      | ---  |
| Normal years                    |              | 600                                                                                        | 600      | 450       | 600                | 600      | 600      | ---  |
| Unfavorable years               |              | 400                                                                                        | 400      | 300       | 400                | 400      | 400      | ---  |



## 1086--Trunk-Malpais-Minat association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Trunk                                                                                      | Malpais  | Minat    | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 2-5      | 20-50    | ---                | ---      | 20-50    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | 5-10     | ---                | ---      | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-10     | ---      | 5-15               | 5-10     | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 2-10     | ---      | 5-15               | 10-30    | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | 2-10     | ---      | ---                | ---      | ---      |
| Desert needlegrass              | STSP3        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | ---      | 2-5                | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | 1-3                | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | 10-20    | ---      |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-2      | ---      | ---                | ---      | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | 2-4      | ---                | ---      | 2-4      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | 2-4      | ---                | ---      | 2-4      |
| Hawksbeard                      | CREPI        | ---                                                                                        | 1-2      | ---      | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | 2-8                | 5-15     | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 10-25    | 15-20    | ---                | 10-25    | 15-20    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5      | ---                | 1-5      | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-15     | 2-5      | 2-5                | 1-5      | 2-5      |
| Shadscale                       | ATCO         | ---                                                                                        | 10-25    | ---      | 30-40              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 2-5      | ---      | 20-30              | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | ---      | ---                | 1-5      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---      |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | ---      | ---                | T-5      | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | 2-10     | ---                | 2-4      | 2-10     |
| Range site number               |              | 024X005N                                                                                   | 024X026N | 024X005N | 024X002N           | 025X025N | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 400      | 800      | 700                | 200      | 800      |
| Normal years                    |              | 600                                                                                        | 300      | 600      | 450                | 150      | 600      |
| Unfavorable years               |              | 400                                                                                        | 200      | 400      | 300                | 100      | 400      |

## 1087--Trunk-Burrita-Colbar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Trunk                                                                                      | Burrita  | Colbar   | 1                  | 2        | 3        | 4    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50    | ---                | 10-15    | 20-50    | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10     | ---                | ---      | 5-10     | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | 5-15               | ---      | ---      | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | 5-15               | 10-15    | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | 1-3                | ---      | ---      | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | 5-20     | ---      | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4      | ---                | ---      | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4      | ---                | ---      | 2-4      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      | ---  |
| Other perennial forbs           | PFFF         | ---                                                                                        | ---      | ---      | 2-8                | ---      | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20    | ---                | ---      | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5      | ---                | ---      | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      | 2-5      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | 30-40              | ---      | ---      | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | 20-30              | ---      | ---      | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | 25-35    | ---      | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10     | ---                | 5-35     | 2-10     | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N | 024X002N           | 024X030N | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 800                                                                                        | 800      | 800      | 700                | 500      | 800      | ---  |
| Normal years                    |              | 600                                                                                        | 600      | 600      | 450                | 350      | 600      | ---  |
| Unfavorable years               |              | 400                                                                                        | 400      | 400      | 300                | 250      | 400      | ---  |

## 1091--Tulase silt loam, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Tulase                                                                                     | 1                  | 2        |
| Bluebunch wheatgrass            | AGSP         | 10-40                                                                                      | 10-40              | 10-40    |
| Thurber needlegrass             | STTH2        | 10-40                                                                                      | 10-40              | 10-40    |
| Basin wildrye                   | ELCI2        | 5-15                                                                                       | 5-15               | 5-15     |
| Indian ricegrass                | ORHY         | 2-10                                                                                       | 2-10               | 2-10     |
| Webber ricegrass                | ORWE         | 2-10                                                                                       | 2-10               | 2-10     |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10               | 2-10     |
| Other perennial grasses         | PPGG         | 2-15                                                                                       | 2-15               | 2-15     |
| Globemallow                     | SPHAE        | 2-5                                                                                        | 2-5                | 2-5      |
| Other perennial forbs           | PPFF         | 2-10                                                                                       | 2-10               | 2-10     |
| Big sagebrush                   | ARTR2        | 10-15                                                                                      | 10-15              | 10-15    |
| Other shrubs                    | SSSS         | 5-15                                                                                       | 5-15               | 5-15     |
| Range site number               |              | 025X019N                                                                                   | 025X019N           | 025X019N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 800                                                                                        | 800                | 800      |
| Normal years                    |              | 600                                                                                        | 600                | 600      |
| Unfavorable years               |              | 400                                                                                        | 400                | 400      |

## 1092--Tulase-Bubus-McConnel association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Tulase                                                                                     | Bubus    | McConnel | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---      | 20-50    | ---                | 20-50    | 20-50    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | 5-10     | ---                | 5-10     | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15     | ---      | 5-10               | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15     | ---      | ---                | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | T-10               | ---      | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | 2-4      | ---                | 2-4      | 2-4      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | 2-4      | ---                | 2-4      | 2-4      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | ---      | 2-8                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 15-20    | ---                | 15-20    | 15-20    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | 2-5      | ---                | 2-5      | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | ---                | 2-5      | 2-5      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | ---      | 30-50              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | ---      | 5-15               | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | 15-30              | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---      | 2-15               | ---      | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | 2-10     | ---                | 2-10     | 2-10     |
| Range site number               |              | 024X005N                                                                                   | 024X002N | 024X005N | 024X003N           | 024X005N | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 700      | 800      | 600                | 800      | 800      |
| Normal years                    |              | 600                                                                                        | 450      | 600      | 450                | 600      | 600      |
| Unfavorable years               |              | 400                                                                                        | 300      | 400      | 300                | 400      | 400      |

1102--Tweba very fine sandy loam, drained, 0 to 4 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Tweba                                                                                      | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | 5-15               | ---      |
| Western wheatgrass              | AGSM         | 5-15                                                                                       | ---                | ---      |
| Inland saltgrass                | DIST         | ---                                                                                        | 5-10               | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | 10-20    |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---                | 5-15     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---                | 2-10     |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | T-5                | ---      |
| Basin big sagebrush             | ARTRT*       | 15-20                                                                                      | ---                | ---      |
| Black greasewood                | SAVE4        | 2-10                                                                                       | 60-75              | ---      |
| Rubber rabbitbrush              | CHNA2        | 2-5                                                                                        | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---                | 30-35    |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---                | 5-15     |
| Range site number               |              | 024X006N                                                                                   | 024X011N           | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 1,500                                                                                      | 500                | 700      |
| Normal years                    |              | 1,100                                                                                      | 350                | 450      |
| Unfavorable years               |              | 600                                                                                        | 200                | 300      |

## 1110--Umbertland silty clay loam, ponded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Umbertland                                                                                 | 1                  | 2        |
| Inland saltgrass                | DIST         | 60-90                                                                                      | ---                | ---      |
| Basin wildrye                   | ELC12        | ---                                                                                        | ---                | 50-60    |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---                | 5-15     |
| Other perennial grasses         | PPGG         | 2-5                                                                                        | ---                | ---      |
| Perennial forbs                 | PPFF         | ---                                                                                        | ---                | 2-8      |
| Seepweed                        | SUAED        | 2-5                                                                                        | ---                | ---      |
| Black greasewood                | SAVE4        | 2-5                                                                                        | ---                | 2-10     |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | 15-20    |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---                | 2-5      |
| Other shrubs                    | SSSS         | 2-5                                                                                        | ---                | ---      |
| Range site number               |              | 026X002N                                                                                   | None               | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 2,000                                                                                      | ---                | 1,500    |
| Normal years                    |              | 1,700                                                                                      | ---                | 1,100    |
| Unfavorable years               |              | 1,200                                                                                      | ---                | 600      |

## 1140--Wendane silt loam, frequently flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Wendane                                                                                    | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | ---                | 5-15     | 50-60    |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---                | ---      | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | ---                | 5-10     | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-10               | ---      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---                | ---      | 5-15     |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10               | ---      | ---      |
| Perennial forbs                 | PPFF         | ---                                                                                        | 2-8                | T-5      | 2-8      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 15-30              | 60-75    | 2-10     |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---                | ---      | 2-5      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-50              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 5-15               | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15               | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | ---      | 15-20    |
| Range site number               |              | 024X007N                                                                                   | 024X003N           | 024X011N | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 1,900                                                                                      | 600                | 500      | 1,500    |
| Normal years                    |              | 1,400                                                                                      | 450                | 350      | 1,100    |
| Unfavorable years               |              | 800                                                                                        | 300                | 200      | 600      |

## 1141--Wendane silt loam, sandy substratum

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |          |
|                                 |              | Wendane                                                                                    | 1                  | 2        | 3        | 4        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | 5-15               | ---      | ---      | 5-15     |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---                | ---      | ---      | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | ---      | ---      | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | 5-10     | 5-10     | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | T-10     | T-10     | ---      |
| Perennial forbs                 | PPFF         | ---                                                                                        | T-5                | 2-8      | 2-8      | T-5      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 60-75              | 15-30    | 15-30    | 60-75    |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---                | ---      | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---                | ---      | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 30-50    | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | 5-15     | 5-15     | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | 2-15     | 2-15     | ---      |
| Range site number               |              | 024X007N                                                                                   | 024X011N           | 024X003N | 024X003N | 024X011N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |          |
| Favorable years                 |              | 1,900                                                                                      | 500                | 600      | 600      | 500      |
| Normal years                    |              | 1,400                                                                                      | 350                | 450      | 450      | 350      |
| Unfavorable years               |              | 800                                                                                        | 200                | 300      | 300      | 200      |



## 1142--Wendane-Tweba association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |
|                                 |              | Wendane                                                                                    | Tweba    | 1                  |
| Basin wildrye                   | ELCI2        | 5-15                                                                                       | 50-60    | 5-20               |
| Inland saltgrass                | DIST         | 5-10                                                                                       | ---      | ---                |
| Western wheatgrass              | AGSM         | ---                                                                                        | 5-15     | ---                |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-5                |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 2-5                |
| Thelypody                       | THELY        | ---                                                                                        | ---      | 2-4                |
| Other perennial forbs           | PPFF         | T-5                                                                                        | 2-8      | ---                |
| Black greasewood                | SAVE4        | 60-75                                                                                      | 2-10     | 20-30              |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 15-20    | 5-15               |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 2-5      | ---                |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 5-10               |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 5-15               |
| Range site number               |              | 024X011N                                                                                   | 024X006N | 024X022N           |
| Potential production (lb/acre): |              |                                                                                            |          |                    |
| Favorable years                 |              | 500                                                                                        | 1,500    | 800                |
| Normal years                    |              | 350                                                                                        | 1,100    | 600                |
| Unfavorable years               |              | 200                                                                                        | 600      | 350                |

1143--Wendane silt loam, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Wendane                                                                                    | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 5-15                                                                                       | 40-60              | 20-40    | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | 5-10               | ---      | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | 15-30              | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---                | ---      | 5-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---                | ---      | T-10     |
| Perennial forbs                 | PPFF         | T-5                                                                                        | ---                | 2-8      | 2-8      |
| Black greasewood                | SAVE4        | 60-75                                                                                      | 5-15               | 5-15     | 15-30    |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | 1-2                | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 1-2                | ---      | ---      |
| Torrey quailbush                | ATTO         | ---                                                                                        | ---                | 30-50    | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | 2-10     | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | ---      | 30-50    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | ---      | 5-15     |
| Seepweed                        | SUAED        | ---                                                                                        | ---                | ---      | 2-15     |
| Range site number               |              | 024X011N                                                                                   | 024X007N           | 024X015N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 1,900              | 1,500    | 600      |
| Normal years                    |              | 350                                                                                        | 1,400              | 1,200    | 450      |
| Unfavorable years               |              | 200                                                                                        | 800                | 800      | 300      |

## 1144--Wendane-Batan-Broyles association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Wendane                                                                                    | Batan    | Broyles  | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | ---      | ---      | ---                | 5-15     |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---      | ---      | ---                | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | ---      | ---      | ---                | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-10     | 5-10     | 5-15               | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | 5-15               | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | 2-5                | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | 1-3                | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | T-10     | T-10     | ---                | ---      |
| Perennial forbs                 | PPFF         | ---                                                                                        | 2-8      | 2-8      | 2-8                | T-5      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 15-30    | 15-30    | ---                | 60-75    |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---      | ---      | ---                | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | ---      | ---      | ---                | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-50    | 30-50    | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 5-15     | 5-15     | 20-30              | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | 2-15     | 2-15     | ---                | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | 2-5                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | 2-5                | ---      |
| Range site number               |              | 024X007N                                                                                   | 024X003N | 024X003N | 024X002N           | 024X011N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 1,900                                                                                      | 600      | 600      | 700                | 500      |
| Normal years                    |              | 1,400                                                                                      | 450      | 450      | 450                | 350      |
| Unfavorable years               |              | 800                                                                                        | 300      | 300      | 300                | 200      |

## 1145--Wendane-Playas association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |        |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |        | Inclusion number-- |          |          |
|                                 |              | Wendane                                                                                    | Playas | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 5-15                                                                                       | ---    | T-5                | 40-60    | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | ---    | T-15               | 5-10     | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---    | 40-70              | 15-30    | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---    | ---                | ---      | 10-20    |
| Needleandthread                 | STCO4        | ---                                                                                        | ---    | ---                | ---      | 5-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---    | ---                | ---      | 2-5      |
| Perennial forbs                 | PPFF         | T-5                                                                                        | ---    | 2-8                | ---      | 2-5      |
| Black greasewood                | SAVE4        | 60-75                                                                                      | ---    | 2-5                | 5-15     | 10-40    |
| Iodinebush                      | ALOC2        | ---                                                                                        | ---    | 10-20              | ---      | ---      |
| Saltbush                        | ATRIP        | ---                                                                                        | ---    | 5-10               | ---      | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---    | ---                | 1-2      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---    | ---                | 1-2      | ---      |
| Range site number               |              | 024X011N                                                                                   | None   | 024X010N           | 024X007N | 027X016N |
| Potential production (lb/acre): |              |                                                                                            |        |                    |          |          |
| Favorable years                 |              | 500                                                                                        | ---    | 450                | 1,900    | 300      |
| Normal years                    |              | 350                                                                                        | ---    | 300                | 1,400    | 200      |
| Unfavorable years               |              | 200                                                                                        | ---    | 150                | 800      | 50       |

## 1146--Wendane-Sonoma-Valmy association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Wendane                                                                                    | Sonoma   | Valmy    | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 40-60                                                                                      | 50-60    | 5-20     | ---                | 20-40    | ---      |
| Alkali sacaton                  | SPAI         | 15-30                                                                                      | ---      | ---      | ---                | ---      | ---      |
| Inland saltgrass                | DIST         | 5-10                                                                                       | ---      | ---      | 5-10               | ---      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | 5-15     | ---      | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-5      | ---                | ---      | 5-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Wildrye                         | ELMYU        | ---                                                                                        | ---      | ---      | 30-60              | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | 5-10               | ---      | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | 2-10               | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | 5-15               | ---      | T-10     |
| Thelypody                       | THELY        | ---                                                                                        | ---      | 2-4      | ---                | ---      | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | ---      | 5-10               | 2-8      | 2-8      |
| Black greasewood                | SAVE4        | 5-15                                                                                       | 2-10     | 20-30    | ---                | 5-15     | 15-30    |
| Alkali rabbitbrush              | CHAL9        | 1-2                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | 1-2                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 15-20    | 5-15     | 2-5                | 2-10     | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---      | ---      | 5-10               | ---      | ---      |
| Silver sagebrush                | ARCA13       | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Torrey quailbush                | ATTO         | ---                                                                                        | ---      | ---      | ---                | 30-50    | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | ---      | 30-50    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-15     |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---      | 2-8                | ---      | ---      |
| Range site number               |              | 024X007N                                                                                   | 024X006N | 024X022N | 025X001N           | 024X015N | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 1,900                                                                                      | 1,500    | 800      | 1,000              | 1,500    | 600      |
| Normal years                    |              | 1,400                                                                                      | 1,100    | 600      | 1,500              | 1,200    | 450      |
| Unfavorable years               |              | 800                                                                                        | 600      | 350      | 1,800              | 800      | 300      |

## 1150--Weso fine sandy loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Weso                                                                                       | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |

1158--Whirlo very fine sandy loam, 2 to 4 percent slopes, occasionally flooded

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Whirlo                                                                                     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10               | 2-5      | 2-10     |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---                | 5-20     | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---                | 2-5      | 5-15     |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | ---      | 10-20    |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---                | ---      | 2-10     |
| Other perennial grasses         | PPGG         | T-10                                                                                       | T-10               | ---      | ---      |
| Thelypody                       | THELY        | ---                                                                                        | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8                | ---      | ---      |
| Shadscale                       | ATCO         | 30-50                                                                                      | 30-50              | ---      | ---      |
| Black greasewood                | SAVE4        | 15-30                                                                                      | 15-30              | 20-30    | ---      |
| Bud sagebrush                   | ARSP5        | 5-15                                                                                       | 5-15               | ---      | ---      |
| Seepweed                        | SUAED        | 2-15                                                                                       | 2-15               | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---                | 5-15     | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---                | 5-10     | 30-35    |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---                | 5-15     | 5-15     |
| Range site number               |              | O24X003N                                                                                   | O24X003N           | O24X022N | O24X020N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 600                                                                                        | 600                | 800      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 600      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 350      | 300      |

## 1160--Whirlo gravelly loam, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Whirlo                                                                                     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 300      |



## 1162--Whirlo silt loam, 0 to 2 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Whirlo                                                                                     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 10-20    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3                | 1-3      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 60-70    |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 500      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 350      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 200      |

## 1163--Whirlo silt loam, 2 to 4 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Whirlo                                                                                     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15               | 5-15     | 10-20    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                | 1-3      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30              | 20-30    | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                | 2-5      | 60-70    |
| Range site number               |              | 024X002N                                                                                   | 024X002N           | 024X002N | 024X004N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700                | 700      | 500      |
| Normal years                    |              | 450                                                                                        | 450                | 450      | 350      |
| Unfavorable years               |              | 300                                                                                        | 300                | 300      | 200      |

## 1165--Whirlo-Creemon association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Whirlo                                                                                     | Creemon  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-10               | ---      | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---                | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---                | ---      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | 50-60    | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---                | 5-15     | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---                | ---      | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | T-10               | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-50              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 5-15               | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---                | ---      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | ---      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | 15-30              | 2-10     | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | 2-15               | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | 15-20    | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---                | ---      | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X003N           | 024X006N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 600                | 1,500    | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 1,100    | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 600      | 300      |

## 1166--Whirlo-Pumper silt loams

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |
|                                 |              | Whirlo                                                                                     | Pumper   | 1                  |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10               |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-10               |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20              |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2                |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 30-35              |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X020N           |
| Potential production (lb/acre): |              |                                                                                            |          |                    |
| Favorable years                 |              | 700                                                                                        | 700      | 700                |
| Normal years                    |              | 450                                                                                        | 450      | 450                |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                |

## 1168--Whirlo-Oxcorel association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Whirlo                                                                                     | Oxcorel  | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10               | 5-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-10               | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20              | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | T-10     |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2                | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                | 30-50    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                | 5-15     |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 30-35              | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---                | 15-30    |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---                | 2-15     |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X020N           | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 600      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      |

## 1169--Whirlo-Broyles association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Whirlo                                                                                     | Broyles  | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | ---                | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---                | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---                | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 20-50              | 10-20    |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | 5-10               | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4                | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 2-4                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20              | 30-35    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5                | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-10               | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X005N           | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 800                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 600                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 400                | 300      |

## 1170--Wholan silt loam

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Wholan                                                                                     | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-20                                                                                      | 5-15               | 5-15     | 5-15     |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STC04        | ---                                                                                        | 1-3                | 1-3      | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      | 2-8      |
| Winterfat                       | EULA5        | 60-70                                                                                      | 2-5                | 2-5      | 2-5      |
| Bud sagebrush                   | ARSP5        | 2-5                                                                                        | 20-30              | 20-30    | 20-30    |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40              | 30-40    | 30-40    |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5                | 2-5      | 2-5      |
| Range site number               |              | 024X004N                                                                                   | 024X002N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 700                | 700      | 700      |
| Normal years                    |              | 350                                                                                        | 450                | 450      | 450      |
| Unfavorable years               |              | 200                                                                                        | 300                | 300      | 300      |

## 1174--Wholan silt loam, sandy substratum

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Wholan                                                                                     | 1                  | 2        |
| Indian ricegrass                | ORHY         | 10-20                                                                                      | 5-15               | 5-15     |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | 2-5      |
| Needleandthread                 | STC04        | ---                                                                                        | 1-3                | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8                | 2-8      |
| Winterfat                       | EULA5        | 60-70                                                                                      | 2-5                | 2-5      |
| Bud sagebrush                   | ARSP5        | 2-5                                                                                        | 20-30              | 20-30    |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40              | 30-40    |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5                | 2-5      |
| Range site number               |              | 024X004N                                                                                   | 024X002N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 500                                                                                        | 700                | 700      |
| Normal years                    |              | 350                                                                                        | 450                | 450      |
| Unfavorable years               |              | 200                                                                                        | 300                | 300      |



## 1177--Wholan, strongly alkaline-Rasille association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Wholan                                                                                     | Rasille  | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-30                                                                                      | ---      | ---                | 5-15     | 5-15     |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---      | ---                | 2-10     | 5-15     |
| Alkali sacaton                  | SPAI         | T-5                                                                                        | ---      | ---                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | ---                | 10-20    | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---                | ---      | ---      |
| Basin wildrye                   | ELC12        | ---                                                                                        | ---      | 50-60              | ---      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | 5-15               | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---                | 2-10     | 2-5      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---                | ---      | 1-3      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---                | 1-2      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | 1-2      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | T-5                                                                                        | ---      | 2-8                | ---      | 2-8      |
| Saltbush                        | ATRIP        | 50-65                                                                                      | ---      | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---                | 30-35    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | ---                | 5-15     | 2-5      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 15-20              | ---      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | 2-10               | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---                | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---                | ---      | 20-30    |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---                | ---      | ---      |
| Range site number               |              | 024X012N                                                                                   | 024X005N | 024X006N           | 024X020N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 800      | 1,500              | 700      | 700      |
| Normal years                    |              | 400                                                                                        | 600      | 1,100              | 450      | 450      |
| Unfavorable years               |              | 200                                                                                        | 400      | 600                | 300      | 300      |

## 1178--Wholan-Rasille association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Wholan                                                                                     | Rasille  | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-20                                                                                      | 20-30    | 10-30              | 5-15     | 20-30    |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-10     | 5-10               | 5-15     | 5-10     |
| Needleandthread                 | STCO4        | ---                                                                                        | 10-20    | ---                | 1-3      | 10-20    |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | ---                | 2-5      | 2-5      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---      | T-5                | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-5      | T-5                | 2-8      | 2-5      |
| Winterfat                       | EULA5        | 60-70                                                                                      | ---      | ---                | 2-5      | ---      |
| Bud sagebrush                   | ARSP5        | 2-5                                                                                        | ---      | ---                | 20-30    | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---                | ---      | 15-20    |
| Saltbush                        | ATRIP        | ---                                                                                        | ---      | 50-65              | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---                | 30-40    | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-15     | ---                | ---      | 5-15     |
| Range site number               |              | 024X004N                                                                                   | 028B010N | 024X012N           | 024X002N | 028B010N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 800      | 700                | 700      | 800      |
| Normal years                    |              | 350                                                                                        | 600      | 400                | 450      | 600      |
| Unfavorable years               |              | 200                                                                                        | 400      | 200                | 300      | 400      |

## 1201--Slaven-Linrose-Cleavage association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |
|                                 |              | Slaven                                                                                     | Linrose  | Cleavage | 1                  | 2    | 3        |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 2-10     | 15-30    | 20-30              | ---  | 5-10     |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---      | ---      | 2-15               | ---  | ---      |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | ---      | ---      | ---                | ---  | 2-5      |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | ---      | 2-10     | 2-10               | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | ---      | ---                | ---  | ---      |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 30-60    | 25-50    | 20-40              | ---  | 30-60    |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-10     | ---      | ---                | ---  | 5-10     |
| Spike fescue                    | HEKI         | ---                                                                                        | ---      | 2-10     | ---                | ---  | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | ---      | 1-5                | ---  | 1-3      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | 1-5                | ---  | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | ---                | ---  | 1-2      |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | ---      | ---      | 5-15               | ---  | 5-15     |
| Black sagebrush                 | ARARN        | ---                                                                                        | 10-20    | ---      | ---                | ---  | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 10-20    | ---                | ---  | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      |
| Range site number               |              | 024X029N                                                                                   | 024X042N | 024X027N | 024X021N           | None | 024X023N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |
| Favorable years                 |              | 1,500                                                                                      | 1,000    | 1,200    | 1,400              | ---  | 1,500    |
| Normal years                    |              | 1,100                                                                                      | 800      | 800      | 1,000              | ---  | 1,200    |
| Unfavorable years               |              | 800                                                                                        | 500      | 600      | 700                | ---  | 900      |

## 1202--Slaven-Wiskan-Graley Variant association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |                | Inclusion number-- |          |      |
|                                 |              | Slaven                                                                                     | Wiskan   | Graley Variant | 1                  | 2        | 3    |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 10-20    | 40-60          | 5-10               | 15-30    | ---  |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---      | 2-5            | ---                | ---      | ---  |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | ---      | ---            | 2-5                | ---      | ---  |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | 5-15     | 5-10           | ---                | 2-10     | ---  |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | ---            | ---                | ---      | ---  |
| Idaho fescue                    | FEID         | 1-10                                                                                       | ---      | ---            | 30-60              | 25-50    | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | 2-10     | ---            | ---                | ---      | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10     | 2-10           | ---                | ---      | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---            | 5-10               | ---      | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---            | 2-5                | ---      | ---  |
| Spike fescue                    | HEKI         | ---                                                                                        | ---      | ---            | ---                | 2-10     | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | 2-5            | 1-3                | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | 2-5            | ---                | ---      | ---  |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---            | 1-2                | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---            | ---                | 2-5      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | 5-15     | ---            | ---                | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | ---      | T-5            | 5-15               | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | 15-30    | ---            | ---                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 5-10           | ---                | ---      | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---            | 2-5                | ---      | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | ---            | ---                | 10-20    | ---  |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---      | ---            | ---                | 2-5      | ---  |
| Range site number               |              | 024X029N                                                                                   | 024X031N | 024X028N       | 024X023N           | 024X027N | None |
| Potential production (lb/acre): |              |                                                                                            |          |                |                    |          |      |
| Favorable years                 |              | 1,500                                                                                      | 700      | 1,000          | 1,500              | 1,200    | ---  |
| Normal years                    |              | 1,100                                                                                      | 500      | 700            | 1,200              | 800      | ---  |
| Unfavorable years               |              | 800                                                                                        | 300      | 500            | 900                | 600      | ---  |

## 1203---Slaven-Glean-Cleavage association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Slaven                                                                                     | Glean    | Cleavage | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 5-10     | 15-30    | 5-10               | ---      | 20-50    |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---      | ---      | ---                | ---      | 5-10     |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | 2-5      | ---      | 10-15              | ---      | 2-15     |
| Thurber needlegrass             | STH2         | 2-5                                                                                        | ---      | 2-10     | ---                | ---      | 2-5      |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | ---      | ---                | 5-10     | 2-5      |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 30-60    | 25-50    | 5-15               | 10-20    | 1-10     |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-10     | ---      | ---                | 2-5      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Spike fescue                    | HEKI         | ---                                                                                        | ---      | 2-10     | 2-15               | ---      | ---      |
| Slender wheatgrass              | AGTR         | ---                                                                                        | ---      | ---      | 10-15              | ---      | ---      |
| Bearded wheatgrass              | AGSU         | ---                                                                                        | ---      | ---      | 10-15              | ---      | ---      |
| Bulbous oniongrass              | MEBU         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 1-3      | ---      | ---                | ---      | 2-5      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Lupine                          | LUPIN        | ---                                                                                        | 1-2      | ---      | 2-5                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Geranium                        | GERAN        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Groundsel                       | SENEC        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | 5-15     | ---      | 5-10               | ---      | 5-15     |
| Snowberry                       | SYMPH        | ---                                                                                        | 2-5      | ---      | 2-10               | ---      | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 10-20    | ---                | 5-15     | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Serviceberry                    | AMELA        | ---                                                                                        | ---      | ---      | 5-10               | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---      |
| Range site number               |              | 024X029N                                                                                   | 024X023N | 024X027N | 024X032N           | 024X016N | 024X029N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 1,500                                                                                      | 1,500    | 1,200    | 2,200              | 350      | 1,500    |
| Normal years                    |              | 1,100                                                                                      | 1,200    | 800      | 1,700              | 250      | 1,100    |
| Unfavorable years               |              | 800                                                                                        | 900      | 600      | 1,200              | 150      | 800      |

## 1212--Wiskan-Roca-Bregar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Wiskan                                                                                     | Roca     | Bregar   | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 10-20                                                                                      | 40-60    | ---      | 2-10               | 15-25    | 5-10     |
| Thurber needlegrass             | STTH2        | 5-15                                                                                       | 5-10     | ---      | ---                | 15-25    | ---      |
| Indian ricegrass                | ORHY         | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10     | ---      | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | 10-20    | 30-60              | ---      | 30-60    |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | 2-5      | 5-10               | ---      | 5-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | 10-20    | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | ---      | 2-5                | 2-5      | 1-3      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | ---      | ---                | 2-5      | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 5-15                                                                                       | ---      | ---      | ---                | 2-10     | ---      |
| Black sagebrush                 | ARARN        | 15-30                                                                                      | ---      | 5-15     | 10-20              | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 5-10     | ---      | ---                | 5-10     | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | T-5      | ---      | ---                | 5-10     | 5-15     |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      |
| Range site number               |              | 024X031N                                                                                   | 024X028N | 024X016N | 024X042N           | 024X035N | 024X023N |
| Potential production (1b/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 1,000    | 350      | 1,000              | 500      | 1,500    |
| Normal years                    |              | 500                                                                                        | 700      | 250      | 800                | 400      | 1,200    |
| Unfavorable years               |              | 300                                                                                        | 500      | 150      | 500                | 250      | 900      |

## 1215--Wiskan-Locane association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Wiskan                                                                                     | Locane   | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 10-20                                                                                      | 15-25    | ---                | 5-10     | 10-20    |
| Thurber needlegrass             | STTH2        | 5-15                                                                                       | 15-25    | ---                | ---      | 5-15     |
| Indian ricegrass                | ORHY         | 2-10                                                                                       | ---      | ---                | ---      | 2-10     |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---                | ---      | 2-10     |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | 10-20              | 30-60    | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10               | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10               | ---      | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | 2-5                | 5-10     | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-20    | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | ---                | 1-3      | 2-5      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | ---                | ---      | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 5-15                                                                                       | 2-10     | ---                | ---      | 5-15     |
| Black sagebrush                 | ARARN        | 15-30                                                                                      | ---      | 5-15               | ---      | 15-30    |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 5-10     | ---                | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-10     | ---                | 5-15     | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 5-15               | ---      | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---                | ---      | ---      |
| Range site number               |              | 024X031N                                                                                   | 024X035N | 024X016N           | 024X023N | 024X031N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 500      | 350                | 1,500    | 700      |
| Normal years                    |              | 500                                                                                        | 400      | 250                | 1,200    | 500      |
| Unfavorable years               |              | 300                                                                                        | 250      | 150                | 900      | 300      |

## 1216--Wiskan-Linrose association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |      |          |
|                                 |              | Wiskan                                                                                     | Linrose  | 1                  | 2    | 3        |
| Bluebunch wheatgrass            | AGSP         | 10-20                                                                                      | 2-10     | 20-50              | ---  | ---      |
| Thurber needlegrass             | STTH2        | 5-15                                                                                       | ---      | 2-5                | ---  | ---      |
| Indian ricegrass                | ORHY         | 2-10                                                                                       | ---      | ---                | ---  | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---                | ---  | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | 30-60    | 1-10               | ---  | 10-20    |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-10     | ---                | ---  | 2-5      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 5-10               | ---  | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | 2-15               | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-5                | ---  | 5-10     |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---                | ---  | 5-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---                | ---  | 2-5      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---                | ---  | 2-5      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | 2-5                | ---  | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 2-5                | ---  | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---                | ---  | 2-5      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | ---  | 2-5      |
| Other perennial forbs           | PPFF         | 5-15                                                                                       | ---      | ---                | ---  | ---      |
| Black sagebrush                 | ARARN        | 15-30                                                                                      | 10-20    | ---                | ---  | 5-15     |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | 5-15               | ---  | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | ---                | ---  | 5-15     |
| Range site number               |              | 024X031N                                                                                   | 024X042N | 024X029N           | None | 024X016N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |      |          |
| Favorable years                 |              | 700                                                                                        | 1,000    | 1,500              | ---  | 350      |
| Normal years                    |              | 500                                                                                        | 800      | 1,100              | ---  | 250      |
| Unfavorable years               |              | 300                                                                                        | 500      | 800                | ---  | 150      |



## 1220--Boulflat-Havingdon-Dewar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |          |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|----------|--------------------|------|
|                                 |              | Soil name                                                                                  |           |          | Inclusion number-- |      |
|                                 |              | Boulflat                                                                                   | Havingdon | Dewar    | 1                  | 2    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 15-25     | 20-50    | 20-50              | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 15-25     | 5-10     | 5-10               | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-20     | ---      | ---                | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---       | 2-4      | 2-4                | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-5       | 2-4      | 2-4                | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5       | ---      | ---                | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-10      | ---      | ---                | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 5-10      | 15-20    | 15-20              | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---       | 2-5      | 2-5                | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---       | 2-5      | 2-5                | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-10      | ---      | ---                | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10      | 2-10     | 2-10               | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X035N  | 024X005N | 024X005N           | None |
| Potential production (lb/acre): |              |                                                                                            |           |          |                    |      |
| Favorable years                 |              | 800                                                                                        | 500       | 800      | 800                | ---  |
| Normal years                    |              | 600                                                                                        | 400       | 600      | 600                | ---  |
| Unfavorable years               |              | 400                                                                                        | 250       | 400      | 400                | ---  |

## 1221--Boulflat-Colbar-Old Camp association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Boulflat                                                                                   | Colbar   | Old Camp | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50    | 10-20              | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10     | ---                | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | 5-15               | 5-15     | 5-15     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | 2-10               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | 2-10               | 2-5      | 2-5      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | ---                | 1-3      | 1-3      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4      | 1-2                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 2-8      | 2-8      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20    | 30-35              | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | 2-5      | 2-5      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | 30-40    | 30-40    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | ---                | 20-30    | 20-30    |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | ---                | 2-5      | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10     | ---                | ---      | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N | 024X020N           | 024X002N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 800      | 700                | 700      | 700      |
| Normal years                    |              | 600                                                                                        | 600      | 600      | 450                | 450      | 450      |
| Unfavorable years               |              | 400                                                                                        | 400      | 400      | 300                | 300      | 300      |

## 1240--Redflame-Kingingham association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |            |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |            | Inclusion number-- |          |          |
|                                 |              | Redflame                                                                                   | Kingingham | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15       | 5-15               | 2-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15       | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5        | 2-5                | 2-10     | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3        | 1-3                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---        | ---                | 10-20    | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---        | ---                | 1-2      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---        | ---                | 1-2      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---        | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8        | 2-8                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40      | 30-40              | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30      | 20-30              | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5        | 2-5                | 5-15     | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5        | 2-5                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---        | ---                | 30-35    | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N   | 024X002N           | 024X020N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |            |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700        | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450        | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300        | 300                | 300      | 300      |

## 1263--Graley-Loncan-Bregar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |
|                                 |              | Graley                                                                                     | Loncan   | Bregar   | 1                  | 2        | 3    |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 20-30    | ---      | 5-10               | 10-20    | ---  |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | 2-15     | ---      | ---                | ---      | ---  |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | ---      | ---      | 2-5                | ---      | ---  |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | 2-10     | ---      | ---                | 5-15     | ---  |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | 5-10     | ---                | ---      | ---  |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 20-40    | 10-20    | 30-60              | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | 2-5      | 5-10               | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 1-5      | ---      | 1-3                | 2-5      | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 1-5      | ---      | ---                | ---      | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | 5-15     | ---      | 5-15               | ---      | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | 15-30    | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  |
| Range site number               |              | 024X029N                                                                                   | 024X021N | 024X016N | 024X023N           | 024X031N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |
| Favorable years                 |              | 1,500                                                                                      | 1,400    | 350      | 1,500              | 700      | ---  |
| Normal years                    |              | 1,100                                                                                      | 1,000    | 250      | 1,200              | 500      | ---  |
| Unfavorable years               |              | 800                                                                                        | 700      | 150      | 900                | 300      | ---  |

## 1280--Ricert-Oxcorel-Whirlo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Ricert                                                                                     | Oxcorel  | Whirlo   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 2-10               | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-10               | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | ---                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | 10-20              | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 1-2                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | ---                | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | ---                | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | ---                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | 30-35              | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X020N           | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      |

## 1281--Ricert-Whirlo-Pineval association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Ricert                                                                                     | Whirlo   | Pineval  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-10     | 5-15               | 2-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 20-30    | 5-15               | 2-10     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 2-5      | 2-5      |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3      | 10-20    | 1-3                | ---      | 1-3      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      |
| Thurber needlegrass             | STH2         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-5      | 2-8                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---      | 30-40              | 10-25    | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---      | 20-30              | 2-5      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---      | 2-5                | 5-15     | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---      | 2-5                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20    | ---                | 10-25    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 028B010N | 024X002N           | 024X026N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 800      | 700                | 400      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 600      | 450                | 300      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 400      | 300                | 200      | 300      |

## 1283--Ricert-Kingingham-Oxcorel association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |            |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |            |          | Inclusion number-- |          |          |
|                                 |              | Ricert                                                                                     | Kingingham | Oxcorel  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15       | 5-15     | 5-15               | 5-10     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15       | 5-15     | 5-15               | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5        | 2-5      | 2-5                | ---      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3        | 1-3      | 1-3                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---        | ---      | ---                | ---      | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---        | ---      | ---                | T-10     | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---        | ---      | ---                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---        | ---      | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---        | ---      | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8        | 2-8      | 2-8                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40      | 30-40    | 30-40              | 30-50    | ---      |
| Bud sagebrush                   | ARSF5        | 20-30                                                                                      | 20-30      | 20-30    | 20-30              | 5-15     | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5        | 2-5      | 2-5                | ---      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5        | 2-5      | 2-5                | ---      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---        | ---      | ---                | 15-30    | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---        | ---      | ---                | 2-15     | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---        | ---      | ---                | ---      | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N   | 024X002N | 024X002N           | 024X003N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700        | 700      | 700                | 600      | 700      |
| Normal years                    |              | 450                                                                                        | 450        | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300        | 300      | 300                | 300      | 300      |

## 1291--Kingingham-Tenabo-Sodhouse association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Kingingham                                                                                 | Tenabo   | Sodhouse | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-10     | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 20-30    | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | 1-3                | 10-20    | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---      | 15-20    |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | 2-8                | 2-5      | 5-10     |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | 30-40              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | 20-30              | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      | ---      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | ---                | 15-20    | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---      | ---                | 5-15     | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X002N           | 028B010N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 800      | 2,500    |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 600      | 1,900    |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 400      | 1,200    |



## 1292--Kingingham-Golconda-Whirlo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Kingingham                                                                                 | Golconda | Whirlo   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 2-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 2-10     | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | 1-3                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | ---                | 10-20    | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | 2-8                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | 30-40              | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | 20-30              | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 5-15     | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | ---                | 30-35    | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X002N           | 024X020N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      | 300      |

## 1293--Kingingham-Oxcorel association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Kingingham                                                                                 | Oxcorel  | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10               | 2-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-10               | 2-10     | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20              | 10-20    | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2                | 1-2      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                | 1-2      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | 5-15     | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 30-35              | 30-35    | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X020N           | 024X020N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      | 300      |

## 1294--Kingingham-Whirlo-Beoska association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Kingingham                                                                                 | Whirlo   | Beoska   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 2-10               | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-10               | 2-5      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | ---                | 1-3      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | 10-20              | ---      | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 1-2                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---      | 1-2      |
| Other perennial forbs           | PFFF         | 2-8                                                                                        | 2-8      | 2-8      | ---                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | ---                | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | ---                | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | 2-5      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | ---                | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | 30-35              | ---      | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X020N           | 024X002N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      | 300      |

## 1342--Doowak, cobbly-Doowak-Veta association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant  | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |        | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |        | Doowak, cobbly                                                                             | Doowak   | Veta     | 1                  | 2        |
| Basin wildrye                   | ELCI2  | 10-20                                                                                      | ---      | ---      | ---                | ---      |
| Indian ricegrass                | ORHY   | 2-10                                                                                       | 5-15     | ---      | ---                | 5-15     |
| Bottlebrush squirreltail        | SIHY   | 2-5                                                                                        | 2-10     | ---      | ---                | 2-10     |
| Sandberg bluegrass              | POSE   | 2-5                                                                                        | 2-10     | ---      | ---                | 2-10     |
| Thurber needlegrass             | STTH2  | ---                                                                                        | 10-20    | 20-50    | 20-50              | 10-20    |
| Bluebunch wheatgrass            | AGSP   | ---                                                                                        | ---      | 5-10     | 5-10               | ---      |
| Tapertip hawksbeard             | CRAC2  | ---                                                                                        | 1-2      | 2-4      | 2-4                | 1-2      |
| Globemallow                     | SPHAE  | ---                                                                                        | 1-2      | ---      | ---                | 1-2      |
| Phlox                           | PHLOX  | ---                                                                                        | 1-2      | ---      | ---                | 1-2      |
| Balsamroot                      | BALSA  | ---                                                                                        | ---      | 2-4      | 2-4                | ---      |
| Spiny hopsage                   | GRSP   | 15-30                                                                                      | 5-15     | 2-5      | 2-5                | 5-15     |
| Basin big sagebrush             | ARTRT* | 15-25                                                                                      | ---      | ---      | ---                | ---      |
| Black greasewood                | SAVE4  | 2-10                                                                                       | ---      | ---      | ---                | ---      |
| Anderson peachbrush             | PRAN2  | 2-10                                                                                       | ---      | ---      | ---                | ---      |
| Rubber rabbitbrush              | CHNA2  | 2-5                                                                                        | ---      | ---      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW* | ---                                                                                        | 30-35    | 15-20    | 15-20              | 30-35    |
| Downy rabbitbrush               | CHVIP  | ---                                                                                        | ---      | 2-5      | 2-5                | ---      |
| Other shrubs                    | SSSS   | ---                                                                                        | ---      | 2-10     | 2-10               | ---      |
| Range site number               |        | 024X041N                                                                                   | 024X020N | 024X005N | 024X005N           | 024X020N |
| Potential production (lb/acre): |        |                                                                                            |          |          |                    |          |
| Favorable years                 |        | 1,000                                                                                      | 700      | 800      | 800                | 700      |
| Normal years                    |        | 800                                                                                        | 450      | 600      | 600                | 450      |
| Unfavorable years               |        | 600                                                                                        | 300      | 400      | 400                | 300      |

## 1392--Rock outcrop-Loncan Variant-Glean association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |                |          | Inclusion number-- |          |          |
|                                 |              | Rock outcrop                                                                               | Loncan Variant | Glean    | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | X              | 5-10     | X                  | 2-10     | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | X              | ---      | ---                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | X              | ---      | X                  | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | X              | ---      | ---                | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | ---            | 30-60    | X                  | 30-60    | 10-20    |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---            | 5-10     | ---                | 5-10     | 2-5      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---            | 2-5      | ---                | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---            | 2-5      | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---            | ---      | X                  | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---            | ---      | X                  | ---      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---            | ---      | ---                | ---      | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---            | ---      | ---                | ---      | 5-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---            | ---      | ---                | ---      | 2-5      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---            | ---      | ---                | ---      | 2-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | X              | ---      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | X              | 1-3      | X                  | 2-5      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | X              | ---      | X                  | ---      | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---            | 1-2      | ---                | ---      | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---            | ---      | ---                | ---      | 2-5      |
| Phlox                           | PHLOX        | ---                                                                                        | ---            | ---      | ---                | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | X              | ---      | ---                | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | X              | ---      | ---                | 10-20    | 5-15     |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | X              | ---      | ---                | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---            | 5-15     | ---                | ---      | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---            | 2-5      | X                  | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---            | ---      | X                  | ---      | ---      |
| Currant                         | RIBES        | ---                                                                                        | ---            | ---      | X                  | ---      | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---            | ---      | ---                | ---      | 5-15     |
| Utah juniper                    | JUOS         | ---                                                                                        | X              | ---      | X                  | ---      | ---      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | X              | ---      | X                  | ---      | ---      |
| Range site number               |              | None                                                                                       | 025X063N       | 024X023N | 025X062N           | 024X042N | 024X016N |
| Potential production (lb/acre): |              |                                                                                            |                |          |                    |          |          |
| Favorable years                 |              | ---                                                                                        | 400            | 1,500    | 500                | 1,000    | 350      |
| Normal years                    |              | ---                                                                                        | 250            | 1,200    | 350                | 800      | 250      |
| Unfavorable years               |              | ---                                                                                        | 150            | 900      | 200                | 500      | 150      |

## 1400--Koynik, steep-Koynik-Rock outcrop association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |
|                                 |              | Koynik, steep                                                                              | Koynik   | Rock outcrop | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | ---          | 5-15               | 2-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---          | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---          | 2-5                | 2-10     | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---          | 1-3                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---          | ---                | 10-20    | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---          | ---                | 1-2      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---          | ---                | 1-2      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---          | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---          | 2-8                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---          | 30-40              | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---          | 20-30              | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---          | 2-5                | 5-15     | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---          | 2-5                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---          | ---                | 30-35    | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | None         | 024X002N           | 024X020N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | ---          | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | ---          | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | ---          | 300                | 300      | 300      |

## 1410--Bojo-Stingdorn association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |            |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|------------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |            | Inclusion number-- |          |      |
|                                 |              | Bojo                                                                                       | Stringdorn | 1                  | 2        | 3    |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---        | ---                | 10-20    | ---  |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15       | 5-15               | 5-15     | ---  |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-15       | 5-15               | 2-10     | ---  |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | 2-5        | 2-5                | 2-10     | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3        | 1-3                | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | ---        | ---                | 1-2      | ---  |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---        | ---                | 1-2      | ---  |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---        | ---                | 1-2      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8        | 2-8                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | ---        | ---                | 30-35    | ---  |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 2-5        | 2-5                | 5-15     | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40      | 30-40              | ---      | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30      | 20-30              | ---      | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5        | 2-5                | ---      | ---  |
| Range site number               |              | 024X020N                                                                                   | 024X002N   | 024X002N           | 024X020N | None |
| Potential production (lb/acre): |              |                                                                                            |            |                    |          |      |
| Favorable years                 |              | 700                                                                                        | 700        | 700                | 700      | ---  |
| Normal years                    |              | 450                                                                                        | 450        | 450                | 450      | ---  |
| Unfavorable years               |              | 300                                                                                        | 300        | 300                | 300      | ---  |

## 1411--Bojo-Rock outcrop-Osoll association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |              |          | Inclusion number-- |          |          |
|                                 |              | Bojo                                                                                       | Rock outcrop | Osoll    | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---          | ---      | ---                | ---      | 20-50    |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---          | 5-15     | 5-15               | 5-15     | ---      |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | ---          | 5-15     | 5-15               | 5-15     | ---      |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | ---          | 2-5      | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---          | 1-3      | 1-3                | 1-3      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---          | ---      | ---                | ---      | 5-10     |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | ---          | ---      | ---                | ---      | 2-4      |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---          | ---      | ---                | ---      | ---      |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---          | ---      | ---                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---          | ---      | ---                | ---      | 2-4      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---          | 2-8      | 2-8                | 2-8      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | ---          | ---      | ---                | ---      | 15-20    |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | ---          | 2-5      | 2-5                | 2-5      | 2-5      |
| Shadscale                       | ATCO         | ---                                                                                        | ---          | 30-40    | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---          | 20-30    | 20-30              | 20-30    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---          | 2-5      | 2-5                | 2-5      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---          | ---      | ---                | ---      | 2-5      |
| Range site number               |              | 024X020N                                                                                   | None         | 024X002N | 024X002N           | 024X002N | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |              |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | ---          | 700      | 700                | 700      | 800      |
| Normal years                    |              | 450                                                                                        | ---          | 450      | 450                | 450      | 600      |
| Unfavorable years               |              | 300                                                                                        | ---          | 300      | 300                | 300      | 400      |



## 1412--Bojo-Humdun-Boulflat association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Bojo                                                                                       | Humdun   | Boulflat | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | ---      | ---      | ---                | ---      | 2-5      |
| Indian ricegrass                | ORHY         | 2-10                                                                                       | ---      | ---      | ---                | ---      | 2-10     |
| Webber ricegrass                | ORWE         | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---      |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | 20-50    | 20-50    | 15-25              | 20-50    | ---      |
| Desert needlegrass              | STSP3        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Pine bluegrass                  | POSC         | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | 5-10     | 15-25              | 5-10     | ---      |
| Basin wildrye                   | ELC12        | ---                                                                                        | ---      | ---      | ---                | ---      | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | 10-20              | ---      | ---      |
| Eriogonum                       | ERIOG        | 1-2                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Hawksbeard                      | CREPI        | 1-2                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | 2-4      | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | 2-4      | 2-5                | 2-4      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | 2-10               | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 10-25                                                                                      | 15-20    | 15-20    | 5-10               | 15-20    | ---      |
| Shadscale                       | ATCO         | 10-25                                                                                      | ---      | ---      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 2-5      | 2-5      | ---                | 2-5      | 15-30    |
| Bud sagebrush                   | ARSP5        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5      | ---                | 2-5      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | ---      | 5-10               | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 15-25    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Anderson peachbrush             | PRAN2        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | 2-10     | 2-10               | 2-10     | ---      |
| Range site number               |              | 024X026N                                                                                   | 024X005N | 024X005N | 024X035N           | 024X005N | 024X041N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 400                                                                                        | 800      | 800      | 500                | 800      | 1,000    |
| Normal years                    |              | 300                                                                                        | 600      | 600      | 400                | 600      | 800      |
| Unfavorable years               |              | 200                                                                                        | 400      | 400      | 250                | 400      | 600      |

## 1420--Sumine-Reluctan-Cleavage association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |      |          |
|                                 |              | Sumine                                                                                     | Reluctan | Cleavage | 1                  | 2    | 3    | 4        |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 20-30    | ---      | 10-20              | ---  | ---  | 20-30    |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | 2-15     | ---      | ---                | ---  | ---  | 2-15     |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | ---      | ---      | ---                | ---  | ---  | ---      |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | 2-10     | ---      | 5-15               | ---  | ---  | 2-10     |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | 5-10     | ---                | ---  | ---  | ---      |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 20-40    | 10-20    | ---                | ---  | ---  | 20-40    |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10     | ---                | ---  | ---  | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---  | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---  | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---  | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | 2-10               | ---  | ---  | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | 2-10               | ---  | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 1-5      | ---      | 2-5                | ---  | ---  | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 1-5      | ---      | ---                | ---  | ---  | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---  | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---  | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | 5-15               | ---  | ---  | ---      |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | 5-15     | ---      | ---                | ---  | ---  | 5-15     |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 5-15     | ---                | ---  | ---  | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | 15-30              | ---  | ---  | ---      |
| Range site number               |              | 024X029N                                                                                   | 024X021N | 024X016N | 024X031N           | None | None | 024X021N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |      |          |
| Favorable years                 |              | 1,500                                                                                      | 1,400    | 350      | 700                | ---  | ---  | 1,400    |
| Normal years                    |              | 1,100                                                                                      | 1,000    | 250      | 500                | ---  | ---  | 1,000    |
| Unfavorable years               |              | 800                                                                                        | 700      | 150      | 300                | ---  | ---  | 700      |

## 1421--Sumine-Softscrabble-Walti association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |              |          | Inclusion number-- |          |      |
|                                 |              | Sumine                                                                                     | Softscrabble | Walti    | 1                  | 2        | 3    |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 20-30        | 15-30    | ---                | ---      | ---  |
| Basin wildrye                   | ELC12        | 5-10                                                                                       | 2-15         | ---      | ---                | ---      | ---  |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | ---          | ---      | ---                | ---      | ---  |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | 2-10         | 2-10     | ---                | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---          | ---      | ---                | 5-10     | ---  |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 20-40        | 25-50    | ---                | 10-20    | ---  |
| Spike fescue                    | HEKI         | ---                                                                                        | ---          | 2-10     | ---                | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---          | ---      | ---                | 5-10     | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---          | ---      | ---                | 2-5      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---          | ---      | ---                | 2-5      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---          | ---      | ---                | 2-5      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 1-5          | ---      | ---                | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 1-5          | ---      | ---                | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---          | 2-5      | ---                | ---      | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---          | ---      | ---                | 2-5      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---          | ---      | ---                | 2-5      | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | 5-15         | ---      | ---                | ---      | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---          | 10-20    | ---                | 5-15     | ---  |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---          | 2-5      | ---                | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---          | ---      | ---                | 5-15     | ---  |
| Range site number               |              | 024X029N                                                                                   | 024X021N     | 024X027N | None               | 024X016N | None |
| Potential production (lb/acre): |              |                                                                                            |              |          |                    |          |      |
| Favorable years                 |              | 1,500                                                                                      | 1,400        | 1,200    | ---                | 350      | ---  |
| Normal years                    |              | 1,100                                                                                      | 1,000        | 800      | ---                | 250      | ---  |
| Unfavorable years               |              | 800                                                                                        | 700          | 600      | ---                | 150      | ---  |

## 1422--Sumine-Hapgood-Cleavage association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |          |
|                                 |              | Sumine                                                                                     | Hapgood  | Cleavage | 1                  | 2        | 3    | 4        |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 5-10     | ---      | 5-10               | 20-30    | ---  | ---      |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---      | ---      | ---                | 2-15     | ---  | 5-10     |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | 10-15    | ---      | 2-5                | ---      | ---  | ---      |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | ---      | ---      | ---                | 2-10     | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | 5-10     | ---                | ---      | ---  | ---      |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 5-15     | 10-20    | 30-60              | 20-40    | ---  | ---      |
| Slender wheatgrass              | AGTR         | ---                                                                                        | 10-15    | ---      | ---                | ---      | ---  | 2-5      |
| Bearded wheatgrass              | AGSU         | ---                                                                                        | 10-15    | ---      | ---                | ---      | ---  | 1-10     |
| Spike fescue                    | HEKI         | ---                                                                                        | 2-15     | ---      | ---                | ---      | ---  | ---      |
| Bulbous oniongrass              | MEBU         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---  | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | 2-5      | 5-10               | ---      | ---  | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---      |
| Nodding brome                   | BRAN         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 1-10     |
| Slender hairgrass               | DEEL         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 2-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 5-10     |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | ---      | ---      | 1-3                | 1-5      | ---  | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | ---                | 1-5      | ---  | ---      |
| Geranium                        | GERAN        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---      |
| Groundsel                       | SENEC        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | 2-5      | ---      | 1-2                | ---      | ---  | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 10-20    |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | 5-10     | ---      | 5-15               | 5-15     | ---  | ---      |
| Serviceberry                    | AMELA        | ---                                                                                        | 5-10     | ---      | ---                | ---      | ---  | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | 2-10     | ---      | 2-5                | ---      | ---  | 2-5      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---  | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---  | ---      |
| Woods rose                      | ROWO         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 5-10     |
| Common chokecherry              | PRVI         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 5-10     |
| Range site number               |              | 024X029N                                                                                   | 024X032N | 024X016N | 024X023N           | 024X021N | None | 028B025N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |          |
| Favorable years                 |              | 1,500                                                                                      | 2,200    | 350      | 1500               | 1,400    | ---  | 1,700    |
| Normal years                    |              | 1,100                                                                                      | 1,700    | 250      | 1200               | 1,000    | ---  | 1,300    |
| Unfavorable years               |              | 800                                                                                        | 1,200    | 150      | 900                | 700      | ---  | 900      |

## 1423--Sumine-Chen-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |
|                                 |              | Sumine                                                                                     | Chen     | Rock outcrop | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 15-30    | ---          | ---                | 20-30    | 20-30    |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---      | ---          | ---                | 2-15     | ---      |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | ---      | ---          | ---                | ---      | ---      |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | 2-10     | ---          | ---                | 2-10     | 15-25    |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | ---          | ---                | ---      | ---      |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 25-50    | ---          | ---                | 20-40    | ---      |
| Spike fescue                    | HEKI         | ---                                                                                        | 2-10     | ---          | ---                | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---          | ---                | ---      | 10-15    |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | ---      | ---          | ---                | 1-5      | 2-5      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---          | ---                | 1-5      | 2-5      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---          | ---                | ---      | 2-5      |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | ---      | ---          | ---                | 5-15     | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 10-20    | ---          | ---                | ---      | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---          | ---                | ---      | 10-15    |
| Range site number               |              | 024X029N                                                                                   | 024X027N | None         | None               | 024X021N | 025X014N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |
| Favorable years                 |              | 1,500                                                                                      | 1,200    | ---          | ---                | 1,400    | 1,000    |
| Normal years                    |              | 1,100                                                                                      | 800      | ---          | ---                | 1,000    | 800      |
| Unfavorable years               |              | 800                                                                                        | 600      | ---          | ---                | 700      | 600      |

## 1425--Sumine-Loncan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |      |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|------|------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |      |      |
|                                 |              | Sumine                                                                                     | Loncan   | 1                  | 2    | 3    |
| Bluebunch wheatgrass            | AGSP         | 30-50                                                                                      | 15-30    | 2-5                | ---  | ---  |
| Basin wildrye                   | ELC12        | 5-10                                                                                       | 2-10     | ---                | ---  | ---  |
| Idaho fescue                    | FEID         | 2-5                                                                                        | 15-40    | 10-30              | ---  | ---  |
| Nevada bluegrass                | PONE3        | 2-5                                                                                        | 2-5      | ---                | ---  | ---  |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | T-10     | ---                | ---  | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 5-15               | ---  | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10               | ---  | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-5                | ---  | ---  |
| Other perennial grasses         | PPGG         | 5-10                                                                                       | 5-10     | 2-8                | ---  | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 5-10     | ---                | ---  | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 1-5      | 2-5                | ---  | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5                | ---  | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 2-5                | ---  | ---  |
| Other perennial forbs           | PPFF         | 2-5                                                                                        | 5-15     | 5-10               | ---  | ---  |
| Antelope bitterbrush            | PUTR2        | 2-15                                                                                       | 5-15     | ---                | ---  | ---  |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | 10-15    | ---                | ---  | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 15-25              | ---  | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 15-25              | ---  | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 1-5                | ---  | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 5-15     | ---                | ---  | ---  |
| Range site number               |              | 025X009N                                                                                   | 025X012N | 025X024N           | None | None |
| Potential production (lb/acre): |              |                                                                                            |          |                    |      |      |
| Favorable years                 |              | 1,300                                                                                      | 1,200    | 350                | ---  | ---  |
| Normal years                    |              | 900                                                                                        | 900      | 250                | ---  | ---  |
| Unfavorable years               |              | 700                                                                                        | 600      | 150                | ---  | ---  |

## 1426--Sumine-Cleavage-Loncan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |          |
|                                 |              | Sumine                                                                                     | Cleavage | Loncan   | 1                  | 2    | 3        | 4        |
| Bluebunch wheatgrass            | AGSP         | 30-50                                                                                      | 2-5      | 15-30    | 15-30              | ---  | 15-25    | ---      |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---      | 2-10     | ---                | ---  | 2-5      | 5-15     |
| Idaho fescue                    | FEID         | 2-5                                                                                        | 10-30    | 5-40     | 30-50              | ---  | 15-30    | ---      |
| Nevada bluegrass                | PONE3        | 2-5                                                                                        | ---      | 2-5      | ---                | ---  | 2-5      | 40-60    |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | ---      | T-10     | ---                | ---  | 2-5      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | 5-15     | ---      | 2-10               | ---  | ---      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10     | ---      | ---                | ---  | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-5      | ---      | 2-5                | ---  | ---      | ---      |
| Alpine timothy                  | PHAL2        | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 20-40    |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 5-15     |
| Meadow barley                   | HOBR2        | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 2-5      |
| Other perennial grasses         | PPGG         | 5-10                                                                                       | 2-8      | 5-10     | 5-15               | ---  | 5-15     | 2-8      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | 5-10     | ---                | ---  | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | 1-5      | ---                | ---  | ---      | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---      | 2-5                | ---  | ---      | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 2-5      |
| Cinquefoil                      | POTEN        | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 2-5      |
| Other perennial forbs           | PPFF         | 2-5                                                                                        | 5-10     | 5-15     | 5-20               | ---  | 10-20    | 2-10     |
| Antelope bitterbrush            | PUTR2        | 2-15                                                                                       | ---      | 5-15     | 0-10               | ---  | 20-40    | ---      |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | ---      | 10-15    | ---                | ---  | 2-10     | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 15-25    | ---      | 10-25              | ---  | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | 15-25    | ---      | ---                | ---  | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 1-5      | ---      | ---                | ---  | ---      | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---      |
| Serviceberry                    | AMELA        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 2-5      |
| Rose                            | ROSA+        | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | 5-15     | 5-15               | ---  | 2-8      | 2-5      |
| Range site number               |              | 025X009N                                                                                   | 025X024N | 025X012N | 025X017N           | None | 025X007N | 025X006N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |          |
| Favorable years                 |              | 1300                                                                                       | 350      | 1,200    | 1,000              | ---  | 1,600    | 1,600    |
| Normal years                    |              | 900                                                                                        | 250      | 900      | 700                | ---  | 1,300    | 1,300    |
| Unfavorable years               |              | 700                                                                                        | 150      | 600      | 400                | ---  | 800      | 800      |

## 1427--Sumine-Itca-Softscrabble association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |      |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |      |          |          |
|                                 |              | Sumine                                                                                     | Itca     | Softscrabble | 1                  | 2    | 3        | 4        |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 10-20    | 20-30        | ---                | ---  | ---      | 15-20    |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---      | 2-15         | ---                | ---  | 50-60    | ---      |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | ---      | ---          | ---                | ---  | ---      | ---      |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | ---      | 2-10         | ---                | ---  | ---      | 15-20    |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---      | ---          | ---                | ---  | ---      | ---      |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 15-25    | 20-40        | ---                | ---  | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10     | ---          | ---                | ---  | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | ---  | 5-15     | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---          | ---                | ---  | 2-10     | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---          | ---                | ---  | 1-5      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 5-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 5-8      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 5-8      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 5-8      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 2-5      | ---          | ---                | ---  | 15-20    | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | 1-5          | ---                | ---  | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 2-5      | 1-5          | ---                | ---  | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 2-5      |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 1-3      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 1-3      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-10     | ---          | ---                | ---  | 5-10     | ---      |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | ---      | 5-15         | ---                | ---  | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | 5-10     | ---          | ---                | ---  | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---          | ---                | ---  | 10-15    | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | ---          | ---                | ---  | ---      | 20-30    |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-15     | ---          | ---                | ---  | 2-5      | ---      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | 2-5      | ---          | ---                | ---  | ---      | ---      |
| Range site number               |              | 024X029N                                                                                   | 025X061N | 024X021N     | None               | None | 025X003N | 024X018N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |      |          |          |
| Favorable years                 |              | 1,500                                                                                      | 500      | 1,400        | ---                | ---  | 2,500    | 700      |
| Normal years                    |              | 1,100                                                                                      | 375      | 1,000        | ---                | ---  | 1,900    | 500      |
| Unfavorable years               |              | 800                                                                                        | 250      | 700          | ---                | ---  | 1,200    | 300      |



## 1428--Sumine-Rubble land-Cleavage association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |             |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-------------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |             |          | Inclusion number-- |          |      |
|                                 |              | Sumine                                                                                     | Rubble land | Cleavage | 1                  | 2        | 3    |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | ---         | ---      | 20-30              | 5-15     | ---  |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---         | ---      | 2-15               | 2-5      | ---  |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | ---         | ---      | ---                | 5-10     | ---  |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | ---         | ---      | 2-10               | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---         | 5-10     | ---                | ---      | ---  |
| Idaho fescue                    | FEID         | 1-10                                                                                       | ---         | 10-20    | 20-40              | 5-15     | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---         | 5-10     | ---                | ---      | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---         | 2-5      | ---                | 2-5      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---         | 2-5      | ---                | ---      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---         | 2-5      | ---                | ---      | ---  |
| Slender wheatgrass              | AGTR         | ---                                                                                        | ---         | ---      | ---                | 2-5      | ---  |
| Bearded wheatgrass              | AGSU         | ---                                                                                        | ---         | ---      | ---                | 2-5      | ---  |
| Letterman needlegrass           | STLE4        | ---                                                                                        | ---         | ---      | ---                | 2-5      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---         | ---      | ---                | 2-5      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | ---         | ---      | 1-5                | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---         | ---      | 1-5                | ---      | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---         | 2-5      | ---                | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---         | 2-5      | ---                | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---         | ---      | ---                | 5-15     | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | ---         | ---      | 5-15               | 5-10     | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---         | 5-15     | ---                | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---         | 5-15     | ---                | ---      | ---  |
| Serviceberry                    | AMELA        | ---                                                                                        | ---         | ---      | ---                | 5-10     | ---  |
| Oceanspray                      | HOLOD        | ---                                                                                        | ---         | ---      | ---                | 5-10     | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | ---         | ---      | ---                | 2-10     | ---  |
| Threetip sagebrush              | ARTR4        | ---                                                                                        | ---         | ---      | ---                | 2-10     | ---  |
| Currant                         | RIBES        | ---                                                                                        | ---         | ---      | ---                | 2-5      | ---  |
| Range site number               |              | 024X029N                                                                                   | None        | 024X016N | 024X021N           | 024X034N | None |
| Potential production (lb/acre): |              |                                                                                            |             |          |                    |          |      |
| Favorable years                 |              | 1,500                                                                                      | ---         | 350      | 1,400              | 1,600    | ---  |
| Normal years                    |              | 1,100                                                                                      | ---         | 250      | 1,000              | 1,300    | ---  |
| Unfavorable years               |              | 800                                                                                        | ---         | 150      | 700                | 800      | ---  |

## 1429--Sumine-Winada Variant-Pernty association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                |          |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------------|----------|--------------------|------|
|                                 |              | Soil name                                                                                  |                |          | Inclusion number-- |      |
|                                 |              | Sumine                                                                                     | Winada Variant | Pernty   | 1                  | 2    |
| Bluebunch wheatgrass            | AGSP         | 20-50                                                                                      | 5-10           | 20-30    | ---                | ---  |
| Basin wildrye                   | ELCI2        | 5-10                                                                                       | ---            | 2-15     | ---                | ---  |
| Mountain brome                  | BRMA4        | 2-15                                                                                       | 10-15          | ---      | ---                | ---  |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | ---            | 2-10     | ---                | ---  |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---            | ---      | 5-10               | ---  |
| Idaho fescue                    | FEID         | 1-10                                                                                       | 5-15           | 20-40    | 10-20              | ---  |
| Slender wheatgrass              | AGTR         | ---                                                                                        | 10-15          | ---      | ---                | ---  |
| Bearded wheatgrass              | AGSU         | ---                                                                                        | 10-15          | ---      | ---                | ---  |
| Spike fescue                    | HEKI         | ---                                                                                        | 2-15           | ---      | ---                | ---  |
| Bulbous oniongrass              | MEBU         | ---                                                                                        | 2-5            | ---      | ---                | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 2-5            | ---      | ---                | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---            | ---      | 5-10               | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---            | ---      | 2-5                | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---            | ---      | 2-5                | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---            | ---      | 2-5                | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | ---            | 1-5      | ---                | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---            | 1-5      | ---                | ---  |
| Geranium                        | GERAN        | ---                                                                                        | 2-5            | ---      | ---                | ---  |
| Groundsel                       | SENEC        | ---                                                                                        | 2-5            | ---      | ---                | ---  |
| Lupine                          | LUPIN        | ---                                                                                        | 2-5            | ---      | ---                | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---            | ---      | 2-5                | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---            | ---      | 2-5                | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | 5-10           | 5-15     | ---                | ---  |
| Serviceberry                    | AMELA        | ---                                                                                        | 5-10           | ---      | ---                | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | 2-10           | ---      | ---                | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---            | ---      | 5-15               | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---            | ---      | 5-15               | ---  |
| Range site number               |              | 024X029N                                                                                   | 024X032N       | 024X021N | 024X016N           | None |
| Potential production (lb/acre): |              |                                                                                            |                |          |                    |      |
| Favorable years                 |              | 1,500                                                                                      | 2,200          | 1,400    | 350                | ---  |
| Normal years                    |              | 1,100                                                                                      | 1,700          | 1,000    | 250                | ---  |
| Unfavorable years               |              | 800                                                                                        | 1,200          | 700      | 150                | ---  |

## 1450--Atlow, steep-Atlow-Stingdorn association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |           |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|-----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |           | Inclusion number-- |          |          |
|                                 |              | Atlow, steep                                                                               | Atlow    | Stingdorn | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 10-15    | 5-15      | ---                | 10-15    | 5-15     |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 10-15    | ---       | 20-50              | 10-15    | 10-20    |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10     | ---       | ---                | 2-10     | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-15      | ---                | ---      | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5       | ---                | ---      | 2-10     |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3       | ---                | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | ---       | 5-10               | ---      | ---      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | 5-20     | ---       | ---                | 5-20     | ---      |
| Globemallow                     | SPHAE        | 2-5                                                                                        | 2-5      | ---       | ---                | 2-5      | 1-2      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---       | 2-4                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---       | 2-4                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---       | ---                | ---      | 1-2      |
| Other perennial forbs           | PFFF         | ---                                                                                        | ---      | 2-8       | ---                | ---      | ---      |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | 25-35    | ---       | ---                | 25-35    | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40     | ---                | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30     | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5       | 2-5                | ---      | 5-15     |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5       | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---       | 15-20              | ---      | 30-35    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---       | 2-5                | ---      | ---      |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 5-35     | ---       | 2-10               | 5-35     | ---      |
| Range site number               |              | 024X030N                                                                                   | 024X030N | 024X002N  | 024X005N           | 024X030N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |           |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 500      | 700       | 800                | 500      | 700      |
| Normal years                    |              | 350                                                                                        | 350      | 450       | 600                | 350      | 450      |
| Unfavorable years               |              | 250                                                                                        | 250      | 300       | 400                | 250      | 300      |

## 1451--Atlow-Reluctan-Trunk association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |
|                                 |              | Atlow                                                                                      | Reluctan | Trunk    | 1                  | 2        | 3    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | ---      | ---                | ---      | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 2-10     | 20-50    | 5-10               | 15-25    | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | 2-10               | ---      | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | 20-40    | ---      | ---                | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 20-30    | 5-10     | 40-60              | 20-30    | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-15     | ---      | 2-5                | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---      | ---                | 10-15    | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-5      | 2-4      | 2-5                | 2-5      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 1-5      | ---      | 2-5                | 2-5      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4      | ---                | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---      | ---                | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-15     | ---      | T-5                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20    | 5-10               | ---      | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | ---                | 10-15    | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | 2-10     | ---                | 5-10     | ---  |
| Range site number               |              | 024X030N                                                                                   | 024X021N | 024X005N | 024X028N           | 025X014N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |
| Favorable years                 |              | 500                                                                                        | 1,400    | 800      | 1,000              | 1,000    | ---  |
| Normal years                    |              | 350                                                                                        | 1,000    | 600      | 700                | 800      | ---  |
| Unfavorable years               |              | 250                                                                                        | 700      | 400      | 500                | 600      | ---  |

## 1452--Atlow-Minat-Old Camp association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |
|                                 |              | Atlow                                                                                      | Minat    | Old Camp | 1                  | 2    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | 5-15     | ---                | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 20-50    | 10-20    | 15-25              | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | ---                | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | 2-10     | 20-30              | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-10     | ---                | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | 2-10               | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---      | 10-15              | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---      | ---                | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---      | ---                | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---      | 2-5                | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---      | 2-5                | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8      | 2-5                | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---      | ---                | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | 15-25    | ---                | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 2-5      | ---                | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | 2-10     | ---                | ---  |
| Epdedra                         | EPHED        | ---                                                                                        | ---      | 2-10     | ---                | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 2-5      | ---                | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | 10-15              | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 2-10     | ---      | 5-10               | ---  |
| Range site number               |              | 024X030N                                                                                   | 024X005N | 024X047N | 025X014N           | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |
| Favorable years                 |              | 500                                                                                        | 800      | 400      | 1,000              | ---  |
| Normal years                    |              | 350                                                                                        | 600      | 300      | 800                | ---  |
| Unfavorable years               |              | 250                                                                                        | 400      | 150      | 600                | ---  |

## 1453--Atlow-Colbar-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |
|                                 |              | Atlow                                                                                      | Colbar   | Rock outcrop | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | ---          | 10-15              | 5-15     | ---      |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 20-50    | ---          | 10-15              | ---      | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---          | 2-10               | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---          | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---          | ---                | 5-15     | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---          | ---                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---          | ---                | 1-3      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---          | ---                | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---          | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---          | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---          | 5-20               | ---      | 15-20    |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---          | 2-5                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---          | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---          | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---          | ---                | 2-8      | 5-10     |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---          | 25-35              | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---          | ---                | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | ---          | ---                | 2-5      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---          | ---                | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---          | ---                | 20-30    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---          | ---                | 2-5      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---          | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 2-10     | ---          | 5-35               | ---      | 2-5      |
| Range site number               |              | 024X030N                                                                                   | 024X005N | None         | 024X030N           | 024X002N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 800      | ---          | 500                | 700      | 2,500    |
| Normal years                    |              | 350                                                                                        | 600      | ---          | 350                | 450      | 1,900    |
| Unfavorable years               |              | 250                                                                                        | 400      | ---          | 250                | 300      | 1,200    |

## 1532--Cleavage-Rubble land-Bregar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |             |          |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-------------|----------|--------------------|------|
|                                 |              | Soil name                                                                                  |             |          | Inclusion number-- |      |
|                                 |              | Cleavage                                                                                   | Rubble land | Bregar   | 1                  | 2    |
| Bluebunch wheatgrass            | AGSP         | 15-30                                                                                      | ---         | ---      | 15-25              | ---  |
| Idaho fescue                    | FEID         | 30-50                                                                                      | ---         | 10-20    | ---                | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---         | ---      | ---                | ---  |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---         | 5-10     | ---                | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---         | 5-10     | ---                | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---         | 2-5      | ---                | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---         | 2-5      | ---                | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---         | 2-5      | ---                | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---         | ---      | 15-25              | ---  |
| Other perennial grasses         | PPGG         | 5-15                                                                                       | ---         | ---      | 10-20              | ---  |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---         | ---      | ---                | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---         | 2-5      | ---                | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---         | 2-5      | 2-5                | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---         | ---      | 2-5                | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---         | ---      | 2-5                | ---  |
| Other perennial forbs           | PPFF         | 5-20                                                                                       | ---         | ---      | 5-15               | ---  |
| Low sagebrush                   | ARAR8        | 10-25                                                                                      | ---         | 5-15     | ---                | ---  |
| Antelope bitterbrush            | PUTR2        | 0-10                                                                                       | ---         | ---      | 2-5                | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---         | 5-15     | ---                | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---         | ---      | 5-10               | ---  |
| Other shrubs                    | SSSS         | 5-15                                                                                       | ---         | ---      | 2-8                | ---  |
| Range site number               |              | 025X017N                                                                                   | None        | 024X016N | 025X021N           | None |
| Potential production (lb/acre): |              |                                                                                            |             |          |                    |      |
| Favorable years                 |              | 1,000                                                                                      | ---         | 350      | 500                | ---  |
| Normal years                    |              | 700                                                                                        | ---         | 250      | 400                | ---  |
| Unfavorable years               |              | 400                                                                                        | ---         | 150      | 250                | ---  |

## 1542--Linrose-Cleavage-Pernty association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Linrose                                                                                    | Cleavage | Pernty   | 1                  | 2        | 3        | 4    |
| Idaho fescue                    | FEID         | 30-60                                                                                      | 25-50    | 20-40    | 30-60              | 1-10     | 10-20    | ---  |
| Cusick bluegrass                | POCU3        | 5-10                                                                                       | ---      | ---      | 5-10               | ---      | 2-5      | ---  |
| Bluebunch wheatgrass            | AGSP         | 2-10                                                                                       | 15-30    | 20-30    | 5-10               | 20-50    | ---      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 2-10     | 2-10     | ---                | 2-5      | ---      | ---  |
| Spike fescue                    | HEKI         | ---                                                                                        | 2-10     | ---      | ---                | ---      | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 2-15     | ---                | 5-10     | ---      | ---  |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---      | 2-5                | 2-15     | ---      | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | 2-5      | 5-10     | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | ---      | 1-5      | 1-3                | 2-5      | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 1-5      | ---                | 2-5      | ---      | ---  |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Black sagebrush                 | ARARN        | 10-20                                                                                      | ---      | ---      | ---                | ---      | 5-15     | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 10-20    | ---      | ---                | ---      | 5-15     | ---  |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | 5-15     | 5-15               | 5-15     | ---      | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | ---  |
| Range site number               |              | 024X042N                                                                                   | 024X027N | 024X021N | 024X023N           | 024X029N | 024X016N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 1000                                                                                       | 1,200    | 1,400    | 1,500              | 1,500    | 350      | ---  |
| Normal years                    |              | 800                                                                                        | 800      | 1,000    | 1,200              | 1,100    | 250      | ---  |
| Unfavorable years               |              | 500                                                                                        | 600      | 700      | 900                | 800      | 150      | ---  |



## 1570--Koynik Variant-Oxcorel-Whirlo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |      |
|                                 |              | Koynik Variant                                                                             | Oxcorel  | Whirlo   | 1                  | 2        | 3    | 4    |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 2-10               | 2-10     | ---  | ---  |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     | ---  | ---  |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-10               | 2-10     | ---  | ---  |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | ---                | ---      | ---  | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | 10-20              | 10-20    | ---  | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 1-2                | 1-2      | ---  | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | 1-2      | ---  | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | 1-2      | ---  | ---  |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | ---                | ---      | ---  | ---  |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | ---                | ---      | ---  | ---  |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | ---                | ---      | ---  | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | 5-15     | ---  | ---  |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | ---                | ---      | ---  | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | 30-35              | 30-35    | ---  | ---  |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X020N           | 024X020N | None | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |      |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      | ---  | ---  |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      | ---  | ---  |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      | ---  | ---  |

## 1662--Floer-Slaven-Roca association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Floer                                                                                      | Slaven   | Roca     | 1                  | 2        | 3        |
| Idaho fescue                    | FEID         | 25-50                                                                                      | ---      | ---      | 30-60              | 30-60    | ---      |
| Bluebunch wheatgrass            | AGSP         | 15-30                                                                                      | 20-30    | 40-60    | 5-10               | 2-10     | 5-10     |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | 15-25    | 5-10     | ---                | ---      | 20-50    |
| Spike fescue                    | HEK1         | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 2-10     | ---      | ---                | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 2-10     | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---      | 5-10               | 5-10     | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-15    | ---      | ---                | ---      | ---      |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | ---      | ---                | ---      | 2-4      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | 2-5      | 1-3                | 2-5      | 2-4      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | 2-5      | ---                | ---      | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Low sagebrush                   | ARAR8        | 10-20                                                                                      | ---      | ---      | ---                | ---      | ---      |
| Douglas rabbitbrush             | CHVI8        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | 10-15    | ---      | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 5-10     | ---                | ---      | 15-20    |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | T-5      | 5-15               | ---      | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | 10-20    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-10     | ---      | ---                | ---      | 2-10     |
| Range site number               |              | 024X027N                                                                                   | 025X014N | 024X028N | 024X023N           | 024X042N | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 1,200                                                                                      | 1,000    | 1,000    | 1,500              | 1,000    | 800      |
| Normal years                    |              | 800                                                                                        | 800      | 700      | 1,200              | 800      | 600      |
| Unfavorable years               |              | 600                                                                                        | 600      | 500      | 900                | 500      | 400      |

## 1670--Wieland-Allor association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Wieland                                                                                    | Allor    | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50              | ---      | 10-20    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10               | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | 50-60    | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---                | 5-15     | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---                | 2-10     | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---                | 1-5      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---                | ---      | 5-15     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---                | ---      | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---                | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | 15-20    | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---                | 5-10     | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20              | ---      | 30-35    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | ---      | 5-15     |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | 10-15    | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10               | 2-5      | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N           | 025X003N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 800                | 2,500    | 700      |
| Normal years                    |              | 600                                                                                        | 600      | 600                | 1,900    | 450      |
| Unfavorable years               |              | 400                                                                                        | 400      | 400                | 1,200    | 300      |

## 1671--Wieland-Oxcorel-Allor association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |          |
|                                 |              | Wieland                                                                                    | Oxcorel  | Allor    | 1                  | 2        | 3        | 4        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---      | 20-50    | 20-50              | 10-15    | 5-10     | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | 5-10     | 5-10               | ---      | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15     | ---      | ---                | ---      | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15     | ---      | ---                | 10-15    | 15-30    | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      | ---      |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---      | ---                | ---      | T-2      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | 5-20     | 5-15     | 15-20    |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | 2-4      | 2-4                | ---      | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | 2-4      | 2-4                | ---      | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | 2-5      | 2-4      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | ---      | ---                | ---      | ---      | 5-10     |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 15-20    | 15-20              | ---      | 15-30    | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | 2-5      | 2-5                | ---      | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      | 2-5      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | ---      | ---                | ---      | 2-5      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | ---      | ---                | ---      | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | 25-35    | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 10-15    |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | 2-10     | 2-10               | 5-35     | 2-5      | 2-5      |
| Range site number               |              | 024X005N                                                                                   | 024X002N | 024X005N | 024X005N           | 024X030N | 024X045N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |          |
| Favorable years                 |              | 800                                                                                        | 700      | 800      | 800                | 500      | 350      | 2,500    |
| Normal years                    |              | 600                                                                                        | 450      | 600      | 600                | 350      | 200      | 1,900    |
| Unfavorable years               |              | 400                                                                                        | 300      | 400      | 400                | 250      | 100      | 1,200    |

## 1673--Wieland-Grassval-Puett association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Wieland                                                                                    | Grassval | Puett    | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 10-15    | ---      | 20-50              | X        | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | ---      | 5-10               | X        | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 10-15    | 10-30    | ---                | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10     | ---      | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | X        | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | X        | 5-15     |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-20     | 10-20    | ---                | ---      | 15-20    |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---      | 2-4                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | ---      | 2-4                | X        | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 5-15     | ---                | ---      | 5-10     |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 10-25    | 15-20              | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | 1-5      | 2-5                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---      | 1-5      | 2-5                | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | 25-35    | 5-15     | ---                | ---      | ---      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | 1-5      | ---                | ---      | ---      |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | T-5      | ---                | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Currant                         | RIBES        | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 5-35     | 2-4      | 2-10               | ---      | 2-5      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Utah juniper                    | JUOS         | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X030N | 025X025N | 024X005N           | 025X062N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 500      | 200      | 800                | 500      | 2,500    |
| Normal years                    |              | 600                                                                                        | 350      | 150      | 600                | 350      | 1,900    |
| Unfavorable years               |              | 400                                                                                        | 250      | 100      | 400                | 200      | 1,200    |

1680--Zineb gravelly loam, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              | Zineb                                                                                      | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---                | 20-50    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---                | 5-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15               | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15               | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5                | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3                | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---                | 2-4      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---                | 2-4      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8                | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---                | 15-20    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---                | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30              | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5                | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---                | 2-10     |
| Range site number               |              | 024X005N                                                                                   | 024X002N           | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 800                                                                                        | 700                | 800      |
| Normal years                    |              | 600                                                                                        | 450                | 600      |
| Unfavorable years               |              | 400                                                                                        | 300                | 400      |

## 1682--Zineb-Doowak-Oxcorel association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Zineb                                                                                      | Doowak   | Oxcorel  | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 10-20    | ---      | 20-50              | 20-50    | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | ---      | 5-10               | 5-10     | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15     | 5-15     | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-10     | 5-15     | ---                | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-10     | 2-5      | ---                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3      | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---      | 15-20    |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---      | 2-4                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 1-2      | ---      | 2-4                | 2-4      | ---      |
| Globeamallow                    | SPHAE        | ---                                                                                        | 1-2      | ---      | ---                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 1-2      | ---      | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8      | ---                | ---      | 5-10     |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 30-35    | ---      | 15-20              | 15-20    | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | ---      | 2-5                | 2-5      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-15     | 2-5      | 2-5                | 2-5      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40    | ---                | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30    | ---                | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---      | 2-10               | 2-10     | 2-5      |
| Range site number               |              | 024X005N                                                                                   | 024X020N | 024X002N | 024X005N           | 024X005N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 700      | 700      | 800                | 800      | 2,500    |
| Normal years                    |              | 600                                                                                        | 450      | 450      | 600                | 600      | 1,900    |
| Unfavorable years               |              | 400                                                                                        | 300      | 300      | 400                | 400      | 1,200    |

## 2060--Oxcorel-Beoska-Whirlo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Oxcorel                                                                                    | Beoska   | Whirlo   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 2-10               | 5-10     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-10               | ---      | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | ---                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | 10-20              | ---      | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | T-10     | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 1-2                | ---      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | ---                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | ---                | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | ---                | 5-15     | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | ---      | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | 30-35              | ---      | 30-35    |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | ---                | 15-30    | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---      | ---                | 2-15     | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X020N           | 024X003N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 600      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      | 300      |



## 2061--Oxcorel-Whirlo-Dun Glen association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |
|                                 |              | Oxcorel                                                                                    | Whirlo   | Dun Glen | 1                  |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | 1-3                |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | 2-8                |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | 30-40              |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | 20-30              |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | 2-5                |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X002N           |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                |

## 2062--Oxcorel-Orovada association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Oxcorel                                                                                    | Orovada  | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 2-10     | 2-10               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-10     | 2-10               | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | ---                | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 10-20    | 10-20              | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-2      | 1-2                | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | 1-2      | 1-2                | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 1-2      | 1-2                | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | ---                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | ---                | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | ---                | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-15     | 5-15               | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | ---                | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 30-35    | 30-35              | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X020N | 024X020N           | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      |

## 2064--Oxcorel-Misad association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Oxcorel                                                                                    | Misad    | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10               | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-10               | 2-10     |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3      | ---                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20              | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 30-35              | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X020N           | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      |

## 2065--Oxcorel-Oxcorel, moderately steep-Pineval association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                           |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|---------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |                           |          | Inclusion number-- |          |
|                                 |              | Oxcorel                                                                                    | Oxcorel, moderately steep | Pineval  | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15                      | ---      | 5-15               | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15                      | ---      | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5                       | ---      | 2-5                | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3                       | ---      | 1-3                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                       | 20-50    | ---                | 10-20    |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---                       | 5-10     | ---                | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---                       | 2-4      | ---                | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                       | 2-4      | ---                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---                       | ---      | ---                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---                       | ---      | ---                | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8                       | ---      | 2-8                | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40                     | ---      | 30-40              | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30                     | ---      | 20-30              | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                       | 2-5      | 2-5                | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5                       | ---      | 2-5                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---                       | 15-20    | ---                | 30-35    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---                       | 2-5      | ---                | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---                       | 2-10     | ---                | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N                  | 024X005N | 024X002N           | 024X020N |
| Potential production (1b/acre): |              |                                                                                            |                           |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700                       | 800      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450                       | 600      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300                       | 400      | 300                | 300      |

## 2066--Oxcorel-Broyles-Dun Glen association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Oxcorel                                                                                    | Broyles  | Dun Glen | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-10               | 2-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | ---                | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | ---                | 2-10     | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3      | ---                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | ---                | 10-20    | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | T-10               | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | 2-8                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | 30-50              | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | 5-15               | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | ---                | 5-15     | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | ---                | ---      | 2-5      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | 15-30              | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | ---      | 2-15               | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | ---                | 30-35    | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X003N           | 024X020N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 600                | 700      | 750      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      | 300      |

## 2067--Oxcorel-Colbar-Stingdorn association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |           |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|-----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |           | Inclusion number-- |          |          |
|                                 |              | Oxcorel                                                                                    | Colbar   | Stingdorn | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | 5-15      | 2-10               | 2-10     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | 5-15      | 2-10               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | 2-5       | 2-5                | 2-10     | 2-10     |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | 1-3       | ---                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | ---       | 2-5                | 10-20    | 10-20    |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---       | ---                | ---      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---       | 2-10               | ---      | ---      |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | ---       | 2-5                | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---       | 2-5                | ---      | ---      |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | ---       | 1-2                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---       | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---       | ---                | 1-2      | 1-2      |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---      | ---       | 1-2                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---       | ---                | 1-2      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---       | ---                | 1-2      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | 2-8       | ---                | ---      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | 30-40     | 10-25              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | 20-30     | 2-5                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5       | 5-15               | 5-15     | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | 2-5       | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---       | 10-25              | 30-35    | 30-35    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---       | 2-5                | ---      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---       | ---                | ---      | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X005N | 024X002N  | 024X026N           | 024X020N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |           |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 800      | 700       | 400                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 600      | 450       | 300                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 400      | 300       | 200                | 300      | 300      |

## 2068--Oxcorel-Golconda-Whirlo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Oxcorel                                                                                    | Golconda | Whirlo   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 2-10     | 2-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15     | 5-15               | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 2-10     | 2-10     |
| Needleandthread                 | STC04        | 1-3                                                                                        | 1-3      | 1-3      | 1-3                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | ---                | 10-20    | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | ---                | 1-2      | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | 1-2      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | 1-2      | 1-2      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | 2-8      | 2-8                | ---      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40    | 30-40              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30    | 20-30              | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 5-15     | 5-15     |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | ---                | 30-35    | 30-35    |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X002N | 024X002N           | 024X020N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700      | 700                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | 300      | 300      |

## 2069--Oxcorel-Rednik-Veta association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Oxcorel                                                                                    | Rednik   | Veta     | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | ---      | ---                | 2-10     | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---      | ---                | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---      | ---                | 2-10     | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---      | ---                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 20-50    | 20-50              | 10-20    | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | 5-10     | 5-10               | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4      | 2-4                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 2-4      | 2-4                | 1-2      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---      | ---                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---      | ---                | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---      | ---                | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 5-15     | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---      | ---                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20    | 15-20              | 30-35    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5      | 2-5                | ---      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-10     | 2-10               | ---      | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X005N | 024X005N           | 024X020N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 800      | 800                | 700      | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 600      | 600                | 450      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 400      | 400                | 300      | 300      |



## 2090--Punchbowl-Robson-Reluctan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |
|                                 |              | Punchbowl                                                                                  | Robson   | Reluctan | 1                  | 2        | 3    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | ---      | ---                | ---      | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 15-20    | 2-10     | ---                | ---      | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 15-20    | 20-30    | 2-10               | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10     | ---      | ---                | 5-10     | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 5-8      | ---      | ---                | 2-5      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | 5-8      | ---      | ---                | 2-5      | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-8      | ---      | 5-10               | 2-5      | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | 20-40    | 30-60              | 10-20    | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 2-15     | ---                | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---      | ---                | ---      | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | 1-3      | ---      | ---                | 2-5      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-5      | 2-5                | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 1-5      | ---                | ---      | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---      | 10-20              | 5-15     | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 20-30    | ---      | ---                | 5-15     | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | ---      | ---                | ---      | ---  |
| Range site number               |              | 024X030N                                                                                   | 024X018N | 024X021N | 024X042N           | 024X016N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |
| Favorable years                 |              | 500                                                                                        | 700      | 1,400    | 1,000              | 350      | ---  |
| Normal years                    |              | 350                                                                                        | 500      | 1,000    | 800                | 250      | ---  |
| Unfavorable years               |              | 250                                                                                        | 300      | 700      | 500                | 150      | ---  |

## 2091--Punchbowl-Teguro-Sumine association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |          |
|                                 |              | Punchbowl                                                                                  | Teguro   | Sumine   | 1                  | 2    | 3        | 4        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | ---      | ---                | ---  | ---      | ---      |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | X        | 2-5      | ---                | ---  | ---      | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | ---                | ---  | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | X        | 20-50    | ---                | ---  | 5-10     | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | X        | 5-10     | ---                | ---  | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | X        | ---      | ---                | ---  | ---      | 5-15     |
| Idaho fescue                    | FEID         | ---                                                                                        | X        | 1-10     | ---                | ---  | 30-60    | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | 2-15     | ---                | ---  | 2-5      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---      | ---                | ---  | 5-10     | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-5      | 1-5      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 2-10     |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---      | ---                | ---  | ---      | 15-20    |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---      | ---                | ---  | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | X        | 2-5      | ---                | ---  | 1-3      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | X        | 2-5      | ---                | ---  | ---      | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | ---                | ---  | 1-2      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 5-10     |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---      | ---                | ---  | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | X        | ---      | ---                | ---  | ---      | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | X        | ---      | ---                | ---  | 2-5      | ---      |
| Currant                         | RIBES        | ---                                                                                        | X        | ---      | ---                | ---  | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | 5-15     | ---                | ---  | 5-15     | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 10-15    |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | ---      | ---                | ---  | ---      | 2-5      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | X        | ---      | ---                | ---  | ---      | ---      |
| Utah juniper                    | JUOS         | ---                                                                                        | X        | ---      | ---                | ---  | ---      | ---      |
| Range site number               |              | 024X030N                                                                                   | 025X062N | 024X029N | None               | None | 024X023N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |          |
| Favorable years                 |              | 500                                                                                        | 500      | 1,500    | ---                | ---  | 1,500    | 2,500    |
| Normal years                    |              | 350                                                                                        | 350      | 1,100    | ---                | ---  | 1,200    | 1,900    |
| Unfavorable years               |              | 250                                                                                        | 200      | 800      | ---                | ---  | 900      | 1,200    |

## 2092--Punchbowl-Belate-Reluctan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |      |
|                                 |              | Punchbowl                                                                                  | Belate   | Reluctan | 1                  | 2        | 3    | 4    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | ---      | 5-15               | ---      | ---  | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 2-10     | 2-10     | ---                | ---      | ---  | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---  | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | 25-50    | 20-40    | ---                | ---      | ---  | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 15-30    | 20-30    | 1-3                | ---      | ---  | ---  |
| Spike fescue                    | HEKI         | ---                                                                                        | 2-10     | ---      | ---                | ---      | ---  | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 2-15     | ---                | 30-50    | ---  | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | 5-15               | ---      | ---  | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  | ---  |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---      | 5-10               | 15-25    | ---  | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---  | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-5      | ---                | ---      | ---  | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 1-5      | ---                | ---      | ---  | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | 5-15               | 2-5      | ---  | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---      | 20-25              | ---      | ---  | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 10-20    | ---      | ---                | ---      | ---  | ---  |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---  | ---  |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---  | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | ---      | 10-20              | 5-10     | ---  | ---  |
| Range site number               |              | 024X030N                                                                                   | 024X027N | 024X021N | 028B016N           | 028B003N | None | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |      |
| Favorable years                 |              | 500                                                                                        | 1,200    | 1,400    | 500                | 2,600    | ---  | ---  |
| Normal years                    |              | 350                                                                                        | 800      | 1,000    | 250                | 1,250    | ---  | ---  |
| Unfavorable years               |              | 250                                                                                        | 600      | 700      | 150                | 800      | ---  | ---  |

## 2094--Punchbowl-Jung-Locane association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Punchbowl                                                                                  | Jung     | Locane   | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 5-15     | 20-30    | ---                | 20-30    | 5-15     |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | ---      | ---      | ---                | ---      | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 5-15     | 10-20    | ---                | 10-20    | 5-10     |
| Pine bluegrass                  | POSC         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10     | ---                | 5-10     | 2-5      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | ---                | 2-5      | ---      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | 5-10     | ---      | ---                | ---      | 5-10     |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 5-15     | 2-5      | ---                | 2-5      | 5-10     |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | 20-25    | ---      | ---                | ---      | ---      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | 2-5      | ---      | ---                | ---      | 2-5      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 2-5      | ---      | ---                | ---      | 5-10     |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20    | ---                | 15-20    | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | ---      | 30-40    |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 10-20    | 5-15     | ---                | 5-15     | 5-15     |
| Range site number               |              | 024X030N                                                                                   | 028B016N | 028B010N | None               | 028B010N | 028B017N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 500      | 800      | ---                | 800      | 700      |
| Normal years                    |              | 350                                                                                        | 250      | 600      | ---                | 600      | 500      |
| Unfavorable years               |              | 250                                                                                        | 150      | 400      | ---                | 400      | 250      |

## 2098--Punchbowl-Clan Alpine-Sumine association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |             |          |                    |      |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-------------|----------|--------------------|------|----------|----------|
|                                 |              | Soil name                                                                                  |             |          | Inclusion number-- |      |          |          |
|                                 |              | Punchbowl                                                                                  | Clan Alpine | Sumine   | 1                  | 2    | 3        | 4        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---         | ---      | ---                | ---  | 5-15     | ---      |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | ---         | 2-5      | ---                | ---  | ---      | X        |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10        | ---      | ---                | ---  | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | 15-25       | 1-10     | ---                | ---  | ---      | X        |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 10-20       | 20-50    | ---                | ---  | 1-3      | X        |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---         | 5-10     | ---                | ---  | ---      | X        |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---         | 2-15     | ---                | ---  | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---         | 2-5      | ---                | ---  | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---         | ---      | ---                | ---  | 5-15     | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---         | ---      | ---                | ---  | 2-5      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---         | ---      | ---                | ---  | ---      | X        |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | 2-5         | ---      | ---                | ---  | 5-10     | ---      |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---         | ---      | ---                | ---  | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5         | 2-5      | ---                | ---  | ---      | X        |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5         | 2-5      | ---                | ---  | ---      | X        |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-10        | ---      | ---                | ---  | 5-15     | ---      |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---         | ---      | ---                | ---  | 20-25    | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | 5-10        | ---      | ---                | ---  | ---      | X        |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---         | 5-15     | ---                | ---  | ---      | ---      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---         | ---      | ---                | ---  | 2-5      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---         | ---      | ---                | ---  | 2-5      | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---         | ---      | ---                | ---  | ---      | X        |
| Currant                         | RIBES        | ---                                                                                        | ---         | ---      | ---                | ---  | ---      | X        |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 5-15        | ---      | ---                | ---  | 10-20    | ---      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | 2-5         | ---      | ---                | ---  | ---      | X        |
| Utah juniper                    | JUOS         | ---                                                                                        | ---         | ---      | ---                | ---  | ---      | X        |
| Range site number               |              | 024X030N                                                                                   | 025X061N    | 024X029N | None               | None | 028B016N | 025X062N |
| Potential production (lb/acre): |              |                                                                                            |             |          |                    |      |          |          |
| Favorable years                 |              | 500                                                                                        | 500         | 1,500    | ---                | ---  | 500      | 500      |
| Normal years                    |              | 350                                                                                        | 375         | 1,100    | ---                | ---  | 250      | 350      |
| Unfavorable years               |              | 250                                                                                        | 250         | 800      | ---                | ---  | 150      | 200      |

## 2099--Punchbowl-Roca-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |          |
|                                 |              | Punchbowl                                                                                  | Roca     | Rock outcrop | 1                  | 2        | 3        | 4        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | ---          | 5-15               | ---      | ---      | ---      |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 5-10     | ---          | ---                | 15-25    | 2-10     | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10     | ---          | ---                | ---      | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 40-60    | ---          | 1-3                | 20-30    | 20-30    | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-5      | ---          | ---                | ---      | 2-15     | 30-50    |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---          | 5-15               | ---      | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---          | 2-5                | ---      | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | 2-10     | ---      | 5-10     |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | ---          | ---                | ---      | 20-40    | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 5-10     |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---          | 5-10               | 10-15    | ---      | 5-15     |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---          | ---                | ---      | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | ---          | ---                | 2-5      | 1-5      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | ---          | ---                | 2-5      | 1-5      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---          | 5-15               | 2-5      | ---      | 5-10     |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---          | 20-25              | ---      | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 5-10     | ---          | ---                | ---      | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | T-5      | ---          | ---                | ---      | 5-15     | ---      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---          | 2-5                | ---      | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---          | 2-5                | ---      | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---          | ---                | 10-15    | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 5-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-5      |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | ---          | 10-20              | 5-10     | ---      | 5-10     |
| Range site number               |              | 024X030N                                                                                   | 024X028N | None         | 028B016N           | 025X014N | 024X021N | 028B024N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |          |
| Favorable years                 |              | 500                                                                                        | 1,000    | ---          | 500                | 1,000    | 1,400    | 2,800    |
| Normal years                    |              | 350                                                                                        | 700      | ---          | 250                | 800      | 1,000    | 1,700    |
| Unfavorable years               |              | 250                                                                                        | 500      | ---          | 150                | 600      | 700      | 1,000    |

## 2100--Grassval-Grina-Unsel Variant association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |               |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|---------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |               | Inclusion number-- |          |          |          |
|                                 |              | Grassval                                                                                   | Grina    | Unsel Variant | 1                  | 2        | 3        | 4        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | X        | 5-15          | 5-15               | 5-15     | 10-15    | 10-30    |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | X        | ---           | ---                | 10-20    | 10-15    | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | X        | ---           | ---                | ---      | 2-10     | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | X        | ---           | ---                | ---      | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | X        | ---           | ---                | ---      | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-15          | 5-15               | 2-10     | ---      | 5-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5           | 2-5                | 2-10     | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3           | 1-3                | ---      | ---      | ---      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---           | ---                | ---      | 5-20     | 10-20    |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---           | ---                | 1-2      | 2-5      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | X        | ---           | ---                | 1-2      | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | X        | ---           | ---                | ---      | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---           | ---                | 1-2      | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8           | 2-8                | ---      | ---      | 5-15     |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---           | ---                | ---      | 25-35    | 5-15     |
| Big sagebrush                   | ARTR2        | ---                                                                                        | X        | ---           | ---                | ---      | ---      | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | X        | ---           | ---                | ---      | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40         | 30-40              | ---      | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30         | 20-30              | ---      | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5           | 2-5                | 5-15     | ---      | 1-5      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5           | 2-5                | ---      | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---           | ---                | 30-35    | ---      | 10-25    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---           | ---                | ---      | ---      | 1-5      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | ---           | ---                | ---      | ---      | 1-5      |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | ---           | ---                | ---      | ---      | T-5      |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | ---           | ---                | ---      | 5-35     | 2-4      |
| Utah juniper                    | JUOS         | ---                                                                                        | X        | ---           | ---                | ---      | ---      | ---      |
| Range site number               |              | 024X030N                                                                                   | 025X059N | 024X002N      | 024X002N           | 024X020N | 024X030N | 025X025N |
| Potential production (lb/acre): |              |                                                                                            |          |               |                    |          |          |          |
| Favorable years                 |              | 500                                                                                        | 500      | 700           | 700                | 700      | 500      | 200      |
| Normal years                    |              | 350                                                                                        | 350      | 450           | 450                | 450      | 350      | 150      |
| Unfavorable years               |              | 250                                                                                        | 200      | 300           | 300                | 300      | 250      | 100      |

## 2104--Grassval-Zineb-Izod association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Grassval                                                                                   | Zineb    | Izod     | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | 10-15    | 10-15              | ---      | ---      |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 20-50    | 10-15    | 10-15              | X        | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | 2-10     | 2-10               | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---      | ---                | X        | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | X        | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | X        | 5-15     |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | 5-20     | 5-20               | ---      | 15-20    |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | 2-5      | 2-5                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---      | ---                | X        | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | 25-35    | 25-35              | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---      | ---                | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Currant                         | RIBES        | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 2-10     | 5-35     | 5-35               | ---      | 2-5      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Utah juniper                    | JUOS         | ---                                                                                        | ---      | ---      | ---                | X        | ---      |
| Range site number               |              | 024X030N                                                                                   | 024X005N | 024X030N | 024X030N           | 025X062N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 800      | 500      | 500                | 500      | 2,500    |
| Normal years                    |              | 350                                                                                        | 600      | 350      | 350                | 350      | 1,900    |
| Unfavorable years               |              | 250                                                                                        | 400      | 250      | 250                | 200      | 1,200    |



2521--Stingdorn very cobbly loam, 4 to 30 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |      |
|                                 |              | Stingdorn                                                                                  | 1                  | 2        | 3    |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---                | ---      | ---  |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---                | ---      | ---  |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---                | ---      | ---  |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---                | ---      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50              | 20-50    | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10               | 5-10     | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4                | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4                | 2-4      | ---  |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---                | ---      | ---  |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---                | ---      | ---  |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---                | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5                | 2-5      | ---  |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20              | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5                | 2-5      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10               | 2-10     | ---  |
| Range site number               |              | 024X002N                                                                                   | 024X005N           | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |                    |          |      |
| Favorable years                 |              | 700                                                                                        | 800                | 800      | ---  |
| Normal years                    |              | 450                                                                                        | 600                | 600      | ---  |
| Unfavorable years               |              | 300                                                                                        | 400                | 400      | ---  |

## 2522--Stingdorn-Stingdorn, steep-Colbar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                  |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|------------------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |                  |          | Inclusion number-- |          |      |
|                                 |              | Stingdorn                                                                                  | Stingdorn, steep | Colbar   | 1                  | 2        | 3    |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15             | ---      | 5-15               | ---      | ---  |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15             | ---      | 5-15               | ---      | ---  |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5              | ---      | 2-5                | ---      | ---  |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3              | ---      | 1-3                | ---      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---              | 20-50    | ---                | 20-50    | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---              | 5-10     | ---                | 5-10     | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---              | 2-4      | ---                | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---              | 2-4      | ---                | 2-4      | ---  |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8              | ---      | 2-8                | ---      | ---  |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40            | ---      | 30-40              | ---      | ---  |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30            | ---      | 20-30              | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5              | 2-5      | 2-5                | 2-5      | ---  |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5              | ---      | 2-5                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---              | 15-20    | ---                | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---              | 2-5      | ---                | 2-5      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | ---              | 2-10     | ---                | 2-10     | ---  |
| Range site number               |              | 024X002N                                                                                   | 024X002N         | 024X005N | 024X002N           | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |                  |          |                    |          |      |
| Favorable years                 |              | 700                                                                                        | 700              | 800      | 700                | 800      | ---  |
| Normal years                    |              | 450                                                                                        | 450              | 600      | 450                | 600      | ---  |
| Unfavorable years               |              | 300                                                                                        | 300              | 400      | 300                | 400      | ---  |

## 2530--Perwick-Puett-Tulase association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |
|                                 |              | Perwick                                                                                    | Puett    | Tulase   | 1                  | 2    |
| Bluebunch wheatgrass            | AGSP         | X                                                                                          | X        | 5-10     | 5-10               | ---  |
| Thurber needlegrass             | STTH2        | X                                                                                          | X        | 20-50    | 20-50              | ---  |
| Indian ricegrass                | ORHY         | X                                                                                          | X        | ---      | ---                | ---  |
| Bluegrass                       | POA++        | X                                                                                          | X        | ---      | ---                | ---  |
| Basin wildrye                   | ELCI2        | X                                                                                          | X        | ---      | ---                | ---  |
| Tapertip hawksbeard             | CRAC2        | X                                                                                          | X        | 2-4      | 2-4                | ---  |
| Arrowleaf balsamroot            | BASA3        | X                                                                                          | X        | ---      | ---                | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4      | 2-4                | ---  |
| Big sagebrush                   | ARTR2        | X                                                                                          | X        | ---      | ---                | ---  |
| Douglas rabbitbrush             | CHVI8        | X                                                                                          | X        | ---      | ---                | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20    | 15-20              | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5      | 2-5                | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5      | 2-5                | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-10     | 2-10               | ---  |
| Utah juniper                    | JUOS         | X                                                                                          | X        | ---      | ---                | ---  |
| Range site number               |              | 025X059N                                                                                   | 025X059N | 024X005N | 024X005N           | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |
| Favorable years                 |              | 500                                                                                        | 500      | 800      | 800                | ---  |
| Normal years                    |              | 350                                                                                        | 350      | 600      | 600                | ---  |
| Unfavorable years               |              | 200                                                                                        | 200      | 400      | 400                | ---  |

## 2540--Buffaran-Wieland association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Buffaran                                                                                   | Wieland  | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50              | 20-50    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10               | 5-10     |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4                | 2-4      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4                | 2-4      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20              | 15-20    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10               | 2-10     |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N           | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 800      | 800                | 800      |
| Normal years                    |              | 600                                                                                        | 600      | 600                | 600      |
| Unfavorable years               |              | 400                                                                                        | 400      | 400                | 400      |

## 2541-Bufferan-Zoesta association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Bufferan                                                                                   | Zoesta   | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 15-20    | 15-25              | ---      | 15-25    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 15-20    | 15-25              | ---      | 20-30    |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10     | ---                | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 5-8      | ---                | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | 5-8      | ---                | ---      | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-8      | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | 50-60    | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---                | 5-15     | 2-10     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---                | 2-10     | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---                | 1-5      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 10-20              | 15-20    | 10-15    |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-5      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | 2-5                | ---      | 2-5      |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-3      | ---                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 1-3      | ---                | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 2-5                | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-10               | 5-10     | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 5-10               | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---      | ---                | ---      | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 20-30    | ---                | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | 5-10               | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | 10-15    | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | 2-10               | 2-5      | 5-10     |
| Range site number               |              | 024X005N                                                                                   | 024X018N | 024X035N           | 025X003N | 025X014N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 700      | 500                | 2,500    | 1,000    |
| Normal years                    |              | 600                                                                                        | 500      | 400                | 1,900    | 800      |
| Unfavorable years               |              | 400                                                                                        | 300      | 250                | 1,200    | 600      |

## 2550--Laped-Old Camp-Colbar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |
|                                 |              | Laped                                                                                      | Old Camp | Colbar   | 1                  | 2    |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | ---      | 2-10               | ---  |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | ---      | 5-15               | ---  |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | ---      | 2-10               | ---  |
| Needleandthread                 | STC04        | 1-3                                                                                        | ---      | ---      | ---                | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | 20-30    | 20-30    | ---                | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 5-10     | 5-10     | 10-20              | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-15     | 5-15     | ---                | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 1-2                | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---  |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 5-10     | 5-10     | ---                | ---  |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | ---      | ---                | ---  |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | ---      | ---                | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-15     | 5-15     | 5-15               | ---  |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | ---      | ---                | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 10-20    | 10-20    | 30-35              | ---  |
| Nevada ephedra                  | EPNE         | ---                                                                                        | 5-10     | 5-10     | ---                | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-10     | 5-10     | ---                | ---  |
| Range site number               |              | 024X002N                                                                                   | 027X007N | 027X007N | 024X020N           | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |
| Favorable years                 |              | 700                                                                                        | 600      | 600      | 700                | ---  |
| Normal years                    |              | 450                                                                                        | 450      | 450      | 450                | ---  |
| Unfavorable years               |              | 300                                                                                        | 300      | 300      | 300                | ---  |

## 2551--Laped-Colbar-Osoll association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Laped                                                                                      | Colbar   | Osoll    | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | 5-15     | 2-10               | ---      | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | 5-15     | 5-15               | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | 2-5      | 2-10               | ---      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | 1-3      | ---                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | ---      | 10-20              | 20-50    | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---      | ---                | 5-10     | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---      | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---      | 1-2                | 2-4      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | 2-8      | ---                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | 30-40    | ---                | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | 20-30    | ---                | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | 2-5      | ---                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---      | 30-35              | 15-20    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---      | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---      | ---                | 2-10     | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X005N | 024X002N | 024X020N           | 024X005N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 800      | 700      | 700                | 800      | 700      |
| Normal years                    |              | 450                                                                                        | 600      | 450      | 450                | 600      | 450      |
| Unfavorable years               |              | 300                                                                                        | 400      | 300      | 300                | 400      | 300      |

## 2552--Laped-Old Camp-Puett association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |
|                                 |              | Laped                                                                                      | Old Camp | Puett    | 1                  | 2    | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | 5-10     | ---                | ---  | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | 10-30    | ---                | ---  | 15-30    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | ---      | ---                | ---  | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | ---      | ---                | ---  | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | ---      | 20-50              | ---  | 5-10     |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---      | 5-10               | ---  | ---      |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---      | ---                | ---  | T-2      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 10-20    | ---                | ---  | 5-15     |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---      | 2-4                | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---      | 2-4                | ---  | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | ---  | 2-4      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | 5-15     | ---                | ---  | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | ---      | ---                | ---  | 2-5      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | ---      | ---                | ---  | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 1-5      | 2-5                | ---  | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | ---      | ---                | ---  | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | 10-25    | 15-20              | ---  | 15-30    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 1-5      | 2-5                | ---  | ---      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | 1-5      | ---                | ---  | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | ---  | ---      |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | T-5      | ---                | ---  | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | 2-4      | 2-10               | ---  | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X005N | 025X025N | 024X005N           | None | 024X045N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |
| Favorable years                 |              | 700                                                                                        | 800      | 200      | 800                | ---  | 350      |
| Normal years                    |              | 450                                                                                        | 600      | 150      | 600                | ---  | 200      |
| Unfavorable years               |              | 300                                                                                        | 400      | 100      | 400                | ---  | 100      |



## 2553--Laped-Stingdorn-Colbar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |           |          | Inclusion number-- |          |          |
|                                 |              | Laped                                                                                      | Stingdorn | Colbar   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15      | ---      | ---                | ---      | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15      | ---      | ---                | ---      | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5       | ---      | ---                | ---      | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3       | ---      | ---                | ---      | 1-3      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---       | 20-50    | ---                | 20-50    | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---       | 5-10     | ---                | 5-10     | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---       | 2-4      | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---       | 2-4      | ---                | 2-4      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8       | ---      | ---                | ---      | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40     | ---      | ---                | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30     | ---      | ---                | ---      | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5       | 2-5      | ---                | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5       | ---      | ---                | ---      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---       | 15-20    | ---                | 15-20    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---       | 2-5      | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---       | 2-10     | ---                | 2-10     | ---      |
| Range site number               |              | 024X002N                                                                                   | 024X002N  | 024X005N | None               | 024X005N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |           |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700       | 800      | ---                | 800      | 700      |
| Normal years                    |              | 450                                                                                        | 450       | 600      | ---                | 600      | 450      |
| Unfavorable years               |              | 300                                                                                        | 300       | 400      | ---                | 400      | 300      |

## 2555--Laped-Colbar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Laped                                                                                      | Colbar   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | 2-10               | 5-15     | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | 2-10               | 5-15     | 15-30    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | ---                | 1-3      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | 2-5                | ---      | 5-10     |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---                | ---      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 2-10               | ---      | ---      |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---                | ---      | T-2      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | ---      | 5-15     |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | 1-2                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---                | ---      | ---      |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---      | 1-2                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | ---      | 2-4      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | ---                | 2-8      | ---      |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | 10-25              | 30-40    | 2-5      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | 2-5                | 20-30    | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | 2-5      | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | ---                | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | 10-25              | ---      | 15-30    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 2-5                | ---      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---                | ---      | 2-5      |
| Range site number               |              | 024X002N                                                                                   | 024X005N | 024X026N           | 024X002N | 024X045N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 800      | 400                | 700      | 350      |
| Normal years                    |              | 450                                                                                        | 600      | 300                | 450      | 200      |
| Unfavorable years               |              | 300                                                                                        | 400      | 200                | 300      | 100      |

## 2561--Puett-Genaw-Orovada association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |
|                                 |              | Puett                                                                                      | Genaw    | Orovada  | 1                  | 2        | 3    |
| Indian ricegrass                | ORHY         | 10-30                                                                                      | 20-30    | 20-30    | 10-15              | 5-15     | ---  |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10     | 5-10     | ---                | 5-15     | ---  |
| Needleandthread                 | STC04        | ---                                                                                        | 10-20    | 10-20    | ---                | 1-3      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | 2-5      | ---                | 2-5      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | 10-15              | ---      | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | 2-10               | ---      | ---  |
| Other perennial grasses         | PPGG         | 10-20                                                                                      | ---      | ---      | 5-20               | ---      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  |
| Other perennial forbs           | PPFF         | 5-15                                                                                       | 2-5      | 2-5      | ---                | 2-8      | ---  |
| Downy rabbitbrush               | CHVIP        | 1-5                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Spiny hopsage                   | GRSP         | 1-5                                                                                        | ---      | ---      | ---                | 2-5      | ---  |
| Antelope bitterbrush            | PUTR2        | 1-5                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Black sagebrush                 | ARARN        | 5-15                                                                                       | ---      | ---      | 25-35              | ---      | ---  |
| Purple sage                     | SACA9        | T-5                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 10-25                                                                                      | 15-20    | 15-20    | ---                | ---      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | 30-40    | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | ---                | 20-30    | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  |
| Other shrubs                    | SSSS         | 2-4                                                                                        | 5-15     | 5-15     | 5-35               | ---      | ---  |
| Range site number               |              | 025X025N                                                                                   | 028B010N | 028B010N | 024X030N           | 024X002N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |
| Favorable years                 |              | 200                                                                                        | 800      | 800      | 500                | 700      | ---  |
| Normal years                    |              | 150                                                                                        | 600      | 600      | 350                | 450      | ---  |
| Unfavorable years               |              | 100                                                                                        | 400      | 400      | 250                | 300      | ---  |

## 2571--Colbar, steep-Burrita-Colbar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Colbar, steep                                                                              | Burrita  | Colbar   | 1                  | 2        | 3        | 4    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50    | ---                | 20-50    | 10-15    | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10     | ---                | 5-10     | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | 5-15               | ---      | ---      | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | 5-15               | ---      | 10-15    | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | 1-3                | ---      | ---      | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-20     | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4      | ---                | 2-4      | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4      | ---                | 2-4      | ---      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | 2-8                | ---      | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20    | ---                | 15-20    | ---      | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5      | ---                | 2-5      | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 2-5      | ---      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | 30-40              | ---      | ---      | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | 20-30              | ---      | ---      | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | ---      | 25-35    | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10     | ---                | 2-10     | 5-35     | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N | 024X002N           | 024X005N | 024X030N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 800                                                                                        | 800      | 800      | 700                | 800      | 500      | ---  |
| Normal years                    |              | 600                                                                                        | 600      | 600      | 450                | 600      | 350      | ---  |
| Unfavorable years               |              | 400                                                                                        | 400      | 400      | 300                | 400      | 250      | ---  |

## 2573--Colbar-Midraw association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |      |
|                                 |              | Colbar                                                                                     | Midraw   | 1                  | 2        | 3    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 5-10     | 10-20              | 20-50    | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 40-60    | ---                | 5-10     | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10     | ---                | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-5      | ---                | ---      | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 5-15               | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-10               | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-10               | ---      | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---                | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-5      | 1-2                | 2-4      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | ---                | ---      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 5-10     | 30-35              | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | ---                | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---      | 5-15               | 2-5      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | T-5      | ---                | ---      | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---                | 2-10     | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X028N | 024X020N           | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |      |
| Favorable years                 |              | 800                                                                                        | 1,000    | 700                | 800      | ---  |
| Normal years                    |              | 600                                                                                        | 700      | 450                | 600      | ---  |
| Unfavorable years               |              | 400                                                                                        | 500      | 300                | 400      | ---  |

## 2575--Colbar-Perwick-Settlemeier association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |             |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|-------------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |             | Inclusion number-- |          |      |
|                                 |              | Colbar                                                                                     | Perwick  | Settlemeier | 1                  | 2        | 3    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 15-25    | ---         | 20-50              | 20-50    | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 15-25    | ---         | 5-10               | 5-10     | ---  |
| Basin wildrye                   | ELC12        | ---                                                                                        | ---      | 50-60       | ---                | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 5-15        | ---                | ---      | ---  |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | 2-10        | ---                | ---      | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---      | 1-5         | ---                | ---      | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-20    | 15-20       | ---                | ---      | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---         | 2-4                | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-5      | ---         | 2-4                | 2-4      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | ---         | ---                | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-10     | 5-10        | ---                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 5-10     | ---         | 15-20              | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | ---         | 2-5                | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---      | ---         | 2-5                | 2-5      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-10     | ---         | ---                | ---      | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 10-15       | ---                | ---      | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-5         | 2-10               | 2-10     | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X035N | 025X003N    | 024X005N           | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |             |                    |          |      |
| Favorable years                 |              | 800                                                                                        | 500      | 2,500       | 800                | 800      | ---  |
| Normal years                    |              | 600                                                                                        | 400      | 1,900       | 600                | 600      | ---  |
| Unfavorable years               |              | 400                                                                                        | 250      | 1,200       | 400                | 400      | ---  |

## 2591--Osol1 Variant-Oxcore1 association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |      |
|                                 |              | Osol1 Variant                                                                              | Oxcore1  | 1                  | 2        | 3        | 4    |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | ---                | 2-10     | 2-10     | ---  |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | ---                | 5-15     | 5-15     | ---  |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---                | 2-10     | 2-5      | ---  |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | ---      | ---      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---                | 10-20    | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---                | 1-2      | ---      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | 1-2      | 1-4      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | 1-2      | 1-4      | ---  |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                | ---      | ---      | ---  |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                | ---      | 2-5      | ---  |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                | ---      | 20-30    | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---                | 5-15     | ---      | ---  |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | ---      | 20-40    | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---                | 30-35    | ---      | ---  |
| Range site number               |              | 024X002N                                                                                   | 024X002N | None               | 024X020N | 024X014N | None |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |      |
| Favorable years                 |              | 700                                                                                        | 700      | ---                | 700      | 400      | ---  |
| Normal years                    |              | 450                                                                                        | 450      | ---                | 450      | 300      | ---  |
| Unfavorable years               |              | 300                                                                                        | 300      | ---                | 300      | 200      | ---  |

## 2600--Grina-Caniwe-Handy association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Grina                                                                                      | Caniwe   | Handy    | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | X                                                                                          | 20-30    | 20-30    | X                  | X        | ---      |
| Thurber needlegrass             | STTH2        | X                                                                                          | 15-25    | 15-25    | X                  | X        | ---      |
| Indian ricegrass                | ORHY         | X                                                                                          | ---      | ---      | ---                | X        | ---      |
| Bluegrass                       | POA++        | X                                                                                          | ---      | ---      | ---                | X        | ---      |
| Basin wildrye                   | ELCI2        | X                                                                                          | ---      | ---      | X                  | X        | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 2-10     | 2-10     | X                  | ---      | 5-15     |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | ---      | X                  | ---      | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-15    | 10-15    | ---                | ---      | 15-20    |
| Tapertip hawksbeard             | CRAC2        | X                                                                                          | 2-5      | 2-5      | X                  | X        | ---      |
| Arrowleaf balsamroot            | BASA3        | X                                                                                          | 2-5      | 2-5      | X                  | X        | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-5      | 2-5      | ---                | ---      | 5-10     |
| Big sagebrush                   | ARTR2        | X                                                                                          | 10-15    | 10-15    | X                  | X        | ---      |
| Douglas rabbitbrush             | CHVI8        | X                                                                                          | ---      | ---      | ---                | X        | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | X                  | ---      | ---      |
| Currant                         | RIBES        | ---                                                                                        | ---      | ---      | X                  | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-10     | 5-10     | ---                | ---      | 2-5      |
| Utah juniper                    | JUOS         | X                                                                                          | ---      | ---      | X                  | X        | ---      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---      | ---      | X                  | ---      | ---      |
| Range site number               |              | 025X059N                                                                                   | 025X014N | 025X014N | 025X062N           | 025X059N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 1,000    | 1,000    | 500                | 500      | 2,500    |
| Normal years                    |              | 350                                                                                        | 800      | 800      | 350                | 350      | 1,900    |
| Unfavorable years               |              | 200                                                                                        | 600      | 600      | 200                | 200      | 1,200    |



## 2602--Grina-Grina, eroded-Caniwe association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |               |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|---------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |               |          | Inclusion number-- |          |          |
|                                 |              | Grina                                                                                      | Grina, eroded | Caniwe   | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | X                                                                                          | X             | 20-30    | X                  | X        | 20-30    |
| Thurber needlegrass             | STTH2        | X                                                                                          | X             | 15-25    | X                  | X        | 15-25    |
| Indian ricegrass                | ORHY         | X                                                                                          | X             | ---      | X                  | X        | ---      |
| Bluegrass                       | POA++        | X                                                                                          | X             | ---      | X                  | X        | ---      |
| Basin wildrye                   | ELCI2        | X                                                                                          | X             | ---      | X                  | X        | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---           | 2-10     | ---                | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---           | 10-15    | ---                | ---      | 10-15    |
| Tapertip hawksbeard             | CRAC2        | X                                                                                          | X             | 2-5      | X                  | X        | 2-5      |
| Arrowleaf balsamroot            | BASA3        | X                                                                                          | X             | 2-5      | X                  | X        | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---           | 2-5      | ---                | ---      | 2-5      |
| Big sagebrush                   | ARTR2        | X                                                                                          | X             | 10-15    | X                  | X        | 10-15    |
| Douglas rabbitbrush             | CHVI8        | X                                                                                          | X             | ---      | X                  | X        | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---           | 5-10     | ---                | ---      | 5-10     |
| Utah juniper                    | JUOS         | X                                                                                          | X             | ---      | X                  | X        | ---      |
| Range site number               |              | 025X059N                                                                                   | 025X059N      | 025X014N | 025X059N           | 025X059N | 025X014N |
| Potential production (lb/acre): |              |                                                                                            |               |          |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 500           | 1,000    | 500                | 500      | 1,000    |
| Normal years                    |              | 350                                                                                        | 350           | 800      | 350                | 350      | 800      |
| Unfavorable years               |              | 200                                                                                        | 200           | 600      | 200                | 200      | 600      |

## 2620--Handy-Caniwe-Zoesta association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Handy                                                                                      | Caniwe   | Zoesta   | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | 20-30    | 15-20    | ---                | 15-20    | X        |
| Thurber needlegrass             | STTH2        | 15-25                                                                                      | 15-25    | 15-20    | ---                | 15-20    | X        |
| Nevada bluegrass                | PONE3        | 2-10                                                                                       | 2-10     | ---      | 5-15               | ---      | X        |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 5-10     | ---                | 5-10     | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 5-8      | ---                | 5-8      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 5-8      | ---                | 5-8      | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | 5-8      | ---                | 5-8      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | 50-60              | ---      | X        |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | 2-10               | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | 1-5                | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | ---      | ---                | ---      | X        |
| Other perennial grasses         | PPGG         | 10-15                                                                                      | 10-15    | ---      | 15-20              | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5      | ---      | ---                | ---      | X        |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 2-5      | ---      | ---                | ---      | X        |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-5      | ---                | 2-5      | ---      |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | 1-3      | ---                | 1-3      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-3      | ---                | 1-3      | ---      |
| Other perennial forbs           | PPFF         | 2-5                                                                                        | 2-5      | ---      | 5-10               | ---      | ---      |
| Big sagebrush                   | ARTR2        | 10-15                                                                                      | 10-15    | ---      | ---                | ---      | X        |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | 20-30    | ---                | 20-30    | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | 10-15              | ---      | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | ---                | ---      | X        |
| Current                         | RIBES        | ---                                                                                        | ---      | ---      | ---                | ---      | X        |
| Other shrubs                    | SSSS         | 5-10                                                                                       | 5-10     | ---      | 2-5                | ---      | ---      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---      | ---      | ---                | ---      | X        |
| Utah juniper                    | JUOS         | ---                                                                                        | ---      | ---      | ---                | ---      | X        |
| Range site number               |              | 025X014N                                                                                   | 025X014N | 024X018N | 025X003N           | 024X018N | 025X062N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 1,000                                                                                      | 1,000    | 700      | 2,500              | 700      | 500      |
| Normal years                    |              | 800                                                                                        | 800      | 500      | 1,900              | 500      | 350      |
| Unfavorable years               |              | 600                                                                                        | 600      | 300      | 1,200              | 300      | 200      |

## 2621--Handy, gravelly-Handy-Zoesta association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name       | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |       |        |                    |       |       |       |
|-------------------------|--------------|--------------------------------------------------------------------------------------------|-------|--------|--------------------|-------|-------|-------|
|                         |              | Soil name                                                                                  |       |        | Inclusion number-- |       |       |       |
|                         |              | Handy, gravelly                                                                            | Handy | Zoesta | 1                  | 2     | 3     | 4     |
| Bluebunch wheatgrass    | AGSP         | 20-30                                                                                      | 20-30 | 15-20  | X                  | 20-30 | ---   | ---   |
| Thurber needlegrass     | STTH2        | 15-25                                                                                      | 15-25 | 15-20  | X                  | 2-10  | 5-10  | ---   |
| Nevada bluegrass        | PONE3        | 2-10                                                                                       | 2-10  | ---    | X                  | ---   | ---   | 5-15  |
| Webber ricegrass        | ORWE         | ---                                                                                        | ---   | 5-10   | ---                | ---   | ---   | ---   |
| Sandberg bluegrass      | POSE         | ---                                                                                        | ---   | 5-8    | ---                | ---   | ---   | ---   |
| Pine bluegrass          | POSC         | ---                                                                                        | ---   | 5-8    | ---                | ---   | ---   | ---   |
| Cusick bluegrass        | POCU3        | ---                                                                                        | ---   | 5-8    | ---                | ---   | ---   | ---   |
| Basin wildrye           | ELCI2        | ---                                                                                        | ---   | ---    | X                  | 2-15  | ---   | 50-60 |
| Idaho fescue            | FEID         | ---                                                                                        | ---   | ---    | X                  | 20-40 | ---   | ---   |
| Indian ricegrass        | ORHY         | ---                                                                                        | ---   | ---    | ---                | ---   | 15-30 | ---   |
| Galleta                 | HIJA         | ---                                                                                        | ---   | ---    | ---                | ---   | T-2   | ---   |
| Mat muhly               | MURI         | ---                                                                                        | ---   | ---    | ---                | ---   | ---   | 2-10  |
| Sedge                   | CAREX        | ---                                                                                        | ---   | ---    | ---                | ---   | ---   | 1-5   |
| Other perennial grasses | PPGG         | 10-15                                                                                      | 10-15 | ---    | ---                | ---   | 5-15  | 15-20 |
| Tapertip hawksbeard     | CRAC2        | 2-5                                                                                        | 2-5   | ---    | X                  | 1-5   | ---   | ---   |
| Arrowleaf balsamroot    | BASA3        | 2-5                                                                                        | 2-5   | ---    | X                  | 1-5   | ---   | ---   |
| Balsamroot              | BALSA        | ---                                                                                        | ---   | 2-5    | ---                | ---   | ---   | ---   |
| Eriogonum               | ERIOG        | ---                                                                                        | ---   | 1-3    | ---                | ---   | ---   | ---   |
| Phlox                   | PHLOX        | ---                                                                                        | ---   | 1-3    | ---                | ---   | ---   | ---   |
| Globemallow             | SPHAE        | ---                                                                                        | ---   | ---    | ---                | ---   | 2-4   | ---   |
| Other perennial forbs   | PPFF         | 2-5                                                                                        | 2-5   | ---    | ---                | ---   | ---   | 5-10  |
| Big sagebrush           | ARTR2        | 10-15                                                                                      | 10-15 | ---    | X                  | ---   | ---   | ---   |
| Low sagebrush           | ARAR8        | ---                                                                                        | ---   | 20-30  | ---                | ---   | ---   | ---   |
| Snowberry               | SYMPH        | ---                                                                                        | ---   | ---    | X                  | ---   | ---   | ---   |
| Currant                 | RIBES        | ---                                                                                        | ---   | ---    | X                  | ---   | ---   | ---   |
| Mountain big sagebrush  | ARTRV        | ---                                                                                        | ---   | ---    | ---                | 5-15  | ---   | ---   |
| Wyoming big sagebrush   | ARTRW*       | ---                                                                                        | ---   | ---    | ---                | ---   | 15-30 | ---   |
| Spiny hopsage           | GRSP         | ---                                                                                        | ---   | ---    | ---                | ---   | 2-5   | ---   |
| Shadscale               | ATCO         | ---                                                                                        | ---   | ---    | ---                | ---   | 2-5   | ---   |
| Basin big sagebrush     | ARTRT*       | ---                                                                                        | ---   | ---    | ---                | ---   | ---   | 10-15 |
| Other shrubs            | SSSS         | 5-10                                                                                       | 5-10  | ---    | ---                | ---   | 2-5   | 2-5   |
| Singleleaf pinyon       | PIMO         | ---                                                                                        | ---   | ---    | X                  | ---   | ---   | ---   |
| Utah juniper            | JUOS         | ---                                                                                        | ---   | ---    | X                  | ---   | ---   | ---   |

| Range site number               | 025X014N | 025X014N | 024X018N | 025X062N | 024X021N | 024X045N | 025X003N |
|---------------------------------|----------|----------|----------|----------|----------|----------|----------|
| Potential production (lb/acre): |          |          |          |          |          |          |          |
| Favorable years                 | 1,000    | 1,000    | 700      | 500      | 1,400    | 350      | 2,500    |
| Normal years                    | 800      | 800      | 500      | 350      | 1,000    | 200      | 1,900    |
| Unfavorable years               | 600      | 600      | 300      | 200      | 700      | 100      | 1,200    |

## 2631--Midraw-Minat-Pineval association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Midraw                                                                                     | Minat    | Pineval  | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 40-60                                                                                      | 5-10     | 5-10     | ---                | 2-10     | ---      |
| Thurber needlegrass             | STTH2        | 5-10                                                                                       | 20-50    | 20-50    | 5-10               | 10-20    | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | 2-5                                                                                        | ---      | ---      | ---                | ---      | 50-60    |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | 15-30              | 5-10     | ---      |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---      | T-2                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | 5-15               | ---      | 15-20    |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-4      | 2-4      | ---                | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | 2-4      | ---                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 2-4                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 2-8      | 5-10     |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | 15-20    | 15-20    | 15-30              | 15-25    | ---      |
| Mountain big sagebrush          | ARTRV        | T-5                                                                                        | ---      | ---      | ---                | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 2-5      | ---                | 2-5      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | 2-5      | 2-5                | 2-10     | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | 2-5                | 2-5      | ---      |
| Ephedra                         | EPHED        | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      |
| Basin big sagebrush             | ARTRI*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | 2-10     | 2-5                | ---      | 2-5      |
| Range site number               |              | 024X028N                                                                                   | 024X005N | 024X005N | 024X045N           | 024X047N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 1,000                                                                                      | 800      | 800      | 350                | 400      | 2,500    |
| Normal years                    |              | 700                                                                                        | 600      | 600      | 200                | 300      | 1,900    |
| Unfavorable years               |              | 500                                                                                        | 400      | 400      | 100                | 150      | 1,200    |

## 2640--Rasille-Kelk association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Rasille                                                                                    | Kelk     | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 20-30                                                                                      | ---      | ---                | 5-15     | ---      |
| Needleandthread                 | STC04        | 10-20                                                                                      | ---      | ---                | 1-3      | ---      |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---      | 5-10               | 5-15     | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | ---                | 2-5      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 50-60    | ---                | ---      | 40-60    |
| Western wheatgrass              | AGSM         | ---                                                                                        | 5-15     | ---                | ---      | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | ---      | ---                | ---      | 15-30    |
| Inland saltgrass                | DIST         | ---                                                                                        | ---      | ---                | ---      | 5-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | T-10               | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-5                                                                                        | 2-8      | 2-8                | 2-8      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | 15-20    | ---                | ---      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | 2-10     | 15-30              | ---      | 5-15     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 2-5      | ---                | ---      | 1-2      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-50              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 5-15               | 20-30    | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | 2-15               | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---                | 2-5      | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | ---      | ---                | ---      | 1-2      |
| Other shrubs                    | SSSS         | 5-15                                                                                       | ---      | ---                | ---      | ---      |
| Range site number               |              | 028B010N                                                                                   | 024X006N | 024X003N           | 024X002N | 024X007N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 1,500    | 600                | 700      | 1,900    |
| Normal years                    |              | 600                                                                                        | 1,100    | 450                | 450      | 1,400    |
| Unfavorable years               |              | 400                                                                                        | 600      | 300                | 300      | 800      |

## 2652--Malpais-Stingdorn association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |           | Inclusion number-- |          |      |
|                                 |              | Malpais                                                                                    | Stingdorn | 1                  | 2        | 3    |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15      | 5-15               | ---      | ---  |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15      | 5-15               | ---      | ---  |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5       | 2-5                | ---      | ---  |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3       | 1-3                | ---      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---       | ---                | 20-50    | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---       | ---                | 5-10     | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---       | ---                | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---       | ---                | 2-4      | ---  |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8       | 2-8                | ---      | ---  |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40     | 30-40              | ---      | ---  |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30     | 20-30              | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5       | 2-5                | 2-5      | ---  |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5       | 2-5                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---       | ---                | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---       | ---                | 2-5      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | ---       | ---                | 2-10     | ---  |
| Range site number               |              | 024X002N                                                                                   | 024X002N  | 024X002N           | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |           |                    |          |      |
| Favorable years                 |              | 700                                                                                        | 700       | 700                | 800      | ---  |
| Normal years                    |              | 450                                                                                        | 450       | 450                | 600      | ---  |
| Unfavorable years               |              | 300                                                                                        | 300       | 300                | 400      | ---  |

## 2670--Zoesta Variant-Jung-McVegas association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |
|                                 |              | Zoesta Variant                                                                             | Jung     | McVegas  | 1                  | 2        | 3    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 10-15    | 5-15     | ---                | ---      | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 10-15    | ---      | 20-50              | 20-50    | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10     | ---      | ---                | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3      | ---                | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | ---      | 5-10               | 5-10     | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | 5-20     | ---      | ---                | ---      | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | 2-5      | ---      | ---                | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---      | 2-4                | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 2-4                | 2-4      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8      | ---                | ---      | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | 25-35    | ---      | ---                | ---      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40    | ---                | ---      | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30    | ---                | ---      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5      | 2-5                | 2-5      | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | 15-20              | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---      | 2-5                | 2-5      | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 5-35     | ---      | 2-10               | 2-10     | ---  |
| Range site number               |              | 024X030N                                                                                   | 024X030N | 024X002N | 024X005N           | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |
| Favorable years                 |              | 500                                                                                        | 500      | 700      | 800                | 800      | ---  |
| Normal years                    |              | 350                                                                                        | 350      | 450      | 600                | 600      | ---  |
| Unfavorable years               |              | 250                                                                                        | 250      | 300      | 400                | 400      | ---  |

## 2681--Tessfive-Puett-Grina association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Tessfive                                                                                   | Puett    | Grina    | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 10-30    | X        | 20-30              | 5-15     | 5-15     |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | ---      | X        | ---                | 10-20    | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | X        | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-10     | ---      | 5-10               | 2-10     | 5-15     |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | 10-20              | ---      | 1-3      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | 2-5                | 2-10     | 2-5      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | 10-20    | ---      | ---                | ---      | ---      |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | X        | ---                | 1-2      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 5-15     | ---      | 2-5                | ---      | 2-8      |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | 5-15     | ---      | ---                | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 1-5      | ---      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 1-5      | ---      | ---                | 5-15     | 2-5      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | 1-5      | ---      | ---                | ---      | ---      |
| Purple sage                     | SACA9        | ---                                                                                        | T-5      | ---      | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 10-25    | ---      | 15-20              | 30-35    | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | ---      | 30-40    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | ---                | ---      | 20-30    |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 2-4      | ---      | 5-15               | ---      | ---      |
| Utah juniper                    | JUOS         | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Range site number               |              | 024X030N                                                                                   | 025X025N | 025X059N | 028B010N           | 024X020N | 024X002N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 200      | 500      | 800                | 700      | 700      |
| Normal years                    |              | 350                                                                                        | 150      | 350      | 600                | 450      | 450      |
| Unfavorable years               |              | 250                                                                                        | 100      | 200      | 400                | 300      | 300      |



## 2711--Burrita-Burnborough association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |             |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-------------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |             | Inclusion number-- |          |          |      |
|                                 |              | Burrita                                                                                    | Burnborough | 1                  | 2        | 3        | 4    |
| Bluebunch wheatgrass            | AGSP         | 40-60                                                                                      | 20-30       | 40-60              | 5-10     | 5-10     | ---  |
| Thurber needlegrass             | STTH2        | 5-10                                                                                       | 2-10        | 5-10               | 20-50    | 20-50    | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---         | 2-10               | ---      | ---      | ---  |
| Basin wildrye                   | ELCI2        | 2-5                                                                                        | 2-15        | 2-5                | ---      | ---      | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | 20-40       | ---                | ---      | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 1-5         | 2-5                | 2-4      | 2-4      | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 1-5         | 2-5                | ---      | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---         | ---                | 2-4      | 2-4      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | ---         | 5-10               | 15-20    | 15-20    | ---  |
| Mountain big sagebrush          | ARTRV        | T-5                                                                                        | 5-15        | T-5                | ---      | ---      | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---         | ---                | 2-5      | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---         | ---                | 2-5      | 2-5      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | ---         | ---                | 2-10     | 2-10     | ---  |
| Range site number               |              | 024X028N                                                                                   | 024X021N    | 024X028N           | 024X005N | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |             |                    |          |          |      |
| Favorable years                 |              | 1,000                                                                                      | 1,400       | 1,000              | 800      | 800      | ---  |
| Normal years                    |              | 700                                                                                        | 1,000       | 700                | 600      | 600      | ---  |
| Unfavorable years               |              | 500                                                                                        | 700         | 500                | 400      | 400      | ---  |

## 2712--Burrita-Alley-Newpass association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Burrita                                                                                    | Alley    | Newpass  | 1                  | 2        | 3        | 4    |
| Bluebunch wheatgrass            | AGSP         | 15-25                                                                                      | 5-10     | 5-10     | ---                | 5-10     | 5-10     | ---  |
| Thurber needlegrass             | STTH2        | 15-25                                                                                      | 20-50    | 20-50    | ---                | 20-50    | 20-50    | ---  |
| Other perennial grasses         | PPGG         | 10-20                                                                                      | ---      | ---      | ---                | ---      | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-4      | 2-4      | ---                | 2-4      | 2-4      | ---  |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | 2-4      | ---                | 2-4      | 2-4      | ---  |
| Other perennial forbs           | PPFF         | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | 15-20    | 15-20    | ---                | 15-20    | 15-20    | ---  |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | ---      | ---      | ---                | ---      | ---      | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 2-5      | ---                | 2-5      | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | 2-5      | ---                | 2-5      | 2-5      | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10     | ---                | 2-10     | 2-10     | ---  |
| Range site number               |              | 024X035N                                                                                   | 024X005N | 024X005N | None               | 024X005N | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 500                                                                                        | 800      | 800      | ---                | 800      | 800      | ---  |
| Normal years                    |              | 400                                                                                        | 600      | 600      | ---                | 600      | 600      | ---  |
| Unfavorable years               |              | 250                                                                                        | 400      | 400      | ---                | 400      | 400      | ---  |

## 2721--Burnborough-Sumine-Burrita association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |      |
|                                 |              | Burnborough                                                                                | Sumine   | Burrita  | 1                  | 2    | 3        | 4    |
| Idaho fescue                    | FEID         | 20-40                                                                                      | 1-10     | ---      | ---                | ---  | X        | ---  |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | 20-50    | 5-10     | ---                | ---  | X        | ---  |
| Basin wildrye                   | ELCI2        | 2-15                                                                                       | 5-10     | ---      | ---                | ---  | X        | ---  |
| Thurber needlegrass             | STH2         | 2-10                                                                                       | 2-5      | 20-50    | 5-10               | ---  | X        | ---  |
| Mountain brome                  | BRMA4        | ---                                                                                        | 2-15     | ---      | ---                | ---  | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | 15-30              | ---  | ---      | ---  |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---      | T-2                | ---  | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | ---  | X        | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | 5-15               | ---  | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | 1-5                                                                                        | 2-5      | 2-4      | ---                | ---  | X        | ---  |
| Arrowleaf balsamroot            | BASA3        | 1-5                                                                                        | 2-5      | ---      | ---                | ---  | X        | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4      | ---                | ---  | ---      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 2-4                | ---  | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | 5-15     | ---      | ---                | ---  | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20    | 15-30              | ---  | ---      | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5      | 2-5                | ---  | ---      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | 2-5                | ---  | ---      | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | ---                | ---  | X        | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | ---                | ---  | X        | ---  |
| Currant                         | RIBES        | ---                                                                                        | ---      | ---      | ---                | ---  | X        | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-10     | 2-5                | ---  | ---      | ---  |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---      | ---      | ---                | ---  | X        | ---  |
| Utah juniper                    | JUOS         | ---                                                                                        | ---      | ---      | ---                | ---  | X        | ---  |
| Range site number               |              | 024X021N                                                                                   | 024X029N | 024X005N | 024X045N           | None | 025X062N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |      |
| Favorable years                 |              | 1,400                                                                                      | 1,500    | 800      | 350                | ---  | 500      | ---  |
| Normal years                    |              | 1,000                                                                                      | 1,100    | 600      | 200                | ---  | 350      | ---  |
| Unfavorable years               |              | 700                                                                                        | 800      | 400      | 100                | ---  | 200      | ---  |

## 2760--Ginex-Burrita-Burrita, south aspect, association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                       |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|-----------------------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |                       | Inclusion number-- |          |          |      |
|                                 |              | Ginex                                                                                      | Burrita  | Burrita, south aspect | 1                  | 2        | 3        | 4    |
| Bluebunch wheatgrass            | AGSP         | X                                                                                          | 5-10     | 40-60                 | 5-10               | ---      | ---      | ---  |
| Thurber needlegrass             | STTH2        | X                                                                                          | 20-50    | 5-10                  | ---                | ---      | 2-5      | ---  |
| Indian ricegrass                | ORHY         | X                                                                                          | ---      | ---                   | ---                | ---      | 2-10     | ---  |
| Bluegrass                       | POA++        | X                                                                                          | ---      | 2-10                  | ---                | ---      | ---      | ---  |
| Basin wildrye                   | ELCI2        | X                                                                                          | ---      | 2-5                   | ---                | 50-60    | ---      | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | ---                   | 30-60              | ---      | ---      | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---                   | 5-10               | ---      | ---      | ---  |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---                   | 2-5                | ---      | ---      | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---                   | 2-5                | 1-5      | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---                   | ---                | 5-15     | ---      | ---  |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---                   | ---                | 2-10     | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---                   | ---                | ---      | 2-10     | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---                   | ---                | ---      | 2-10     | ---  |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | ---                   | ---                | ---      | 2-5      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---                   | ---                | ---      | 2-5      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---                   | ---                | ---      | 2-5      | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                   | ---                | 15-20    | ---      | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | ---                   | ---                | ---      | 1-2      | ---  |
| Tapertip hawksbeard             | CRAC2        | X                                                                                          | 2-4      | 2-5                   | 1-3                | ---      | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | X                                                                                          | ---      | 2-5                   | ---                | ---      | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---                   | ---                | ---      | ---      | ---  |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---                   | 1-2                | ---      | ---      | ---  |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---      | ---                   | ---                | ---      | 1-2      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---                   | ---                | 5-10     | ---      | ---  |
| Big sagebrush                   | ARTR2        | X                                                                                          | ---      | ---                   | ---                | ---      | ---      | ---  |
| Douglas rabbitbrush             | CHVI8        | X                                                                                          | ---      | ---                   | ---                | ---      | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | 5-10                  | ---                | ---      | 10-25    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---                   | ---                | ---      | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | ---                   | ---                | ---      | 5-15     | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | T-5                   | 5-15               | ---      | ---      | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---                   | 2-5                | ---      | ---      | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                   | ---                | 10-15    | ---      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---                   | ---                | ---      | 10-25    | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---                   | ---                | ---      | 2-5      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---                   | ---                | 2-5      | ---      | ---  |
| Utah juniper                    | JUOS         | X                                                                                          | ---      | ---                   | ---                | ---      | ---      | ---  |
| Range site number               |              | 025X059N                                                                                   | 024X005N | 024X028N              | 024X023N           | 025X003N | 024X026N | None |
| Potential production (lb/acre): |              |                                                                                            |          |                       |                    |          |          |      |
| Favorable years                 |              | 500                                                                                        | 800      | 1,000                 | 1,500              | 2,500    | 400      | ---  |
| Normal years                    |              | 350                                                                                        | 600      | 700                   | 1,200              | 1,900    | 300      | ---  |
| Unfavorable years               |              | 200                                                                                        | 400      | 500                   | 900                | 1,200    | 200      | ---  |

## 2771--Kram-Hopeka-Rock outcrop association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |
|                                 |              | Kram                                                                                       | Hopeka   | Rock outcrop | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | X                                                                                          | X        | ---          | ---                | 20-30    | ---      |
| Indian ricegrass                | ORHY         | X                                                                                          | X        | ---          | 10-15              | ---      | ---      |
| Thurber needlegrass             | STTH2        | X                                                                                          | X        | ---          | 10-15              | 2-10     | ---      |
| Bluegrass                       | POA++        | X                                                                                          | X        | ---          | 2-10               | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | ---          | ---                | 20-40    | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---          | ---                | 2-15     | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---          | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---          | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | X                                                                                          | X        | ---          | 5-20               | ---      | 15-20    |
| Tapertip hawksbeard             | CRAC2        | X                                                                                          | X        | ---          | ---                | 1-5      | ---      |
| Arrowleaf balsamroot            | BASA3        | X                                                                                          | X        | ---          | ---                | 1-5      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---          | 2-5                | ---      | ---      |
| Other perennial forbs           | PPFF         | X                                                                                          | X        | ---          | ---                | ---      | 5-10     |
| Black sagebrush                 | ARARN        | X                                                                                          | X        | ---          | 25-35              | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | X                                                                                          | X        | ---          | ---                | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | ---          | ---                | 5-15     | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---          | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | X                                                                                          | X        | ---          | 5-35               | ---      | 2-5      |
| Utah juniper                    | JUOS         | X                                                                                          | X        | ---          | ---                | ---      | ---      |
| Singleleaf pinyon               | PIMO         | X                                                                                          | X        | ---          | ---                | ---      | ---      |
| Range site number               |              | 025X063N                                                                                   | 025X063N | None         | 024X030N           | 024X021N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |
| Favorable years                 |              | 400                                                                                        | 400      | ---          | 500                | 1,400    | 2,500    |
| Normal years                    |              | 250                                                                                        | 250      | ---          | 350                | 1,000    | 1,900    |
| Unfavorable years               |              | 150                                                                                        | 150      | ---          | 250                | 700      | 1,200    |

## 2783--Desatoya, steep-Spike-Desatoya association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Desatoya, steep                                                                            | Spike    | Desatoya | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 15-30    | 10-15    | 20-30              | ---      | 20-30    |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 5-10     | 10-15    | ---                | ---      | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | 2-10     | ---                | ---      | ---      |
| Galleta                         | HIJA         | ---                                                                                        | T-2      | ---      | ---                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | 10-20              | ---      | 10-20    |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | 5-10               | ---      | 5-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | 2-5                | ---      | 2-5      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | 30-50    | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | 5-15     | 5-20     | ---                | 15-25    | ---      |
| Globemallow                     | SPHAE        | 2-5                                                                                        | 2-4      | 2-5      | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | 2-5                | 2-5      | 2-5      |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | 25-35    | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-30    | ---      | 15-20              | ---      | 15-20    |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---      |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 2-5      | 5-35     | 5-15               | 5-10     | 5-15     |
| Range site number               |              | 024X030N                                                                                   | 024X045N | 024X030N | 028B010N           | 028B003N | 028B010N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 350      | 500      | 800                | 2,600    | 800      |
| Normal years                    |              | 350                                                                                        | 200      | 350      | 600                | 1,250    | 600      |
| Unfavorable years               |              | 250                                                                                        | 100      | 250      | 400                | 800      | 400      |

## 2790--Old Camp-Minat-Osoll association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |
|                                 |              | Old Camp                                                                                   | Minat    | Osoll    | 1                  | 2    | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---      | 10-20              | ---  | 10-20    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---      | ---                | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-15     | 2-10               | ---  | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 5-15     | 5-15               | ---  | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | 2-10               | ---  | 2-10     |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3      | ---                | ---  | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---      | ---                | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---      | 1-2                | ---  | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 1-2                | ---  | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | 1-2                | ---  | 1-2      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8      | ---                | ---  | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---      | 30-35              | ---  | 30-35    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---      | ---                | ---  | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | ---  | 5-15     |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40    | ---                | ---  | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30    | ---                | ---  | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---      | ---                | ---  | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X002N | 024X020N           | None | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |
| Favorable years                 |              | 800                                                                                        | 800      | 700      | 700                | ---  | 700      |
| Normal years                    |              | 600                                                                                        | 600      | 450      | 450                | ---  | 450      |
| Unfavorable years               |              | 400                                                                                        | 400      | 300      | 300                | ---  | 300      |

## 2791--Old Camp-Colbar-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |
|                                 |              | Old Camp                                                                                   | Colbar   | Rock outcrop | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---          | 5-10               | ---      | 10-20    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---          | 40-60              | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---          | 2-10               | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---          | 2-5                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---          | ---                | 5-15     | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---          | ---                | 5-15     | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---          | ---                | 2-5      | 2-10     |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---          | ---                | 1-3      | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---          | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---          | 2-5                | ---      | 1-2      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---          | 2-5                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---          | ---                | ---      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---          | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---          | ---                | 2-8      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---          | 5-10               | ---      | 30-35    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---          | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---          | ---                | 2-5      | 5-15     |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | ---          | T-5                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---          | ---                | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---          | ---                | 20-30    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---          | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---          | ---                | ---      | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | None         | 024X028N           | 024X002N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | ---          | 1,000              | 700      | 700      |
| Normal years                    |              | 600                                                                                        | 600      | ---          | 700                | 450      | 450      |
| Unfavorable years               |              | 400                                                                                        | 400      | ---          | 500                | 300      | 300      |



## 2793--Old Camp-Laped association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |      |
|                                 |              | Old Camp                                                                                   | Laped    | 1                  | 2        | 3        | 4    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---      | 2-5                | 20-50    | 10-20    | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | ---                | 5-10     | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15     | 2-10               | ---      | 2-10     | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15     | 2-10               | ---      | 5-15     | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | 2-5                | ---      | 2-10     | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | ---                | ---      | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | 2-10               | ---      | ---      | ---  |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | 2-5                | ---      | ---      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | 2-5                | ---      | ---      | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---                | 2-4      | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | ---                | 2-4      | 1-2      | ---  |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---      | 1-2                | ---      | ---      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---                | ---      | 1-2      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---                | ---      | 1-2      | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | 1-2                | ---      | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | ---                | ---      | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 10-25              | 15-20    | 30-35    | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | 2-5                | 2-5      | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | 2-5      | 5-15     | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | 10-25              | ---      | ---      | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | 2-5                | ---      | ---      | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---                | ---      | ---      | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---                | 2-10     | ---      | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X002N | 024X026N           | 024X005N | 024X020N | None |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |      |
| Favorable years                 |              | 800                                                                                        | 700      | 400                | 800      | 700      | ---  |
| Normal years                    |              | 600                                                                                        | 450      | 300                | 600      | 450      | ---  |
| Unfavorable years               |              | 400                                                                                        | 300      | 200                | 400      | 300      | ---  |

## 2794--Old Camp-Kram Variant-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |              |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|--------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |              |              | Inclusion number-- |          |          |
|                                 |              | Old Camp                                                                                   | Kram Variant | Rock outcrop | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 10-20        | ---          | ---                | 10-20    | 10-15    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 2-10         | ---          | ---                | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15         | ---          | 5-15               | 5-15     | 10-15    |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-10         | ---          | 5-15               | 2-10     | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---          | ---          | 2-5                | 2-10     | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---          | ---          | 1-3                | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---          | ---          | ---                | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---          | ---          | ---                | ---      | 5-20     |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---          | ---          | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---          | ---          | ---                | 1-2      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---          | ---          | ---                | 1-2      | 2-5      |
| Phlox                           | PHLOX        | ---                                                                                        | ---          | ---          | ---                | 1-2      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8          | ---          | 2-8                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-25        | ---          | ---                | 30-35    | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5          | ---          | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-10         | ---          | 2-5                | 5-15     | ---      |
| Ephedra                         | EPHED        | ---                                                                                        | 2-10         | ---          | ---                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 2-5          | ---          | 30-40              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---          | ---          | 20-30              | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---          | ---          | 2-5                | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---          | ---          | ---                | ---      | 25-35    |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---          | ---          | ---                | ---      | 5-35     |
| Range site number               |              | 024X005N                                                                                   | 024X047N     | None         | 024X002N           | 024X020N | 024X030N |
| Potential production (lb/acre): |              |                                                                                            |              |              |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 400          | ---          | 700                | 700      | 500      |
| Normal years                    |              | 600                                                                                        | 300          | ---          | 450                | 450      | 350      |
| Unfavorable years               |              | 400                                                                                        | 150          | ---          | 300                | 300      | 250      |

## 2796--Old Camp-Osoll-Colbar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Old Camp                                                                                   | Osoll    | Colbar   | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---      | 20-50    | ---                | ---      | 10-15    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | 5-10     | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15     | ---      | 5-15               | 5-15     | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15     | ---      | 5-15               | 5-15     | 10-15    |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | ---      | 2-5                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | ---      | 1-3                | 1-3      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-20     |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | 2-4      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | 2-4      | ---                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | ---      | 2-8                | 2-8      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 15-20    | ---                | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 2-5                | 2-5      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | ---      | 30-40              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | ---      | 20-30              | 20-30    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---      | 2-5                | 2-5      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | ---      | 25-35    |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | 2-10     | ---                | ---      | 5-35     |
| Range site number               |              | 024X005N                                                                                   | 024X002N | 024X005N | 024X002N           | 024X002N | 024X030N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 700      | 800      | 700                | 700      | 500      |
| Normal years                    |              | 600                                                                                        | 450      | 600      | 450                | 450      | 350      |
| Unfavorable years               |              | 400                                                                                        | 300      | 400      | 300                | 300      | 250      |

## 2797--Old Camp, steep-Colbar-Old Camp association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Old Camp, steep                                                                            | Colbar   | Old Camp | 1                  | 2        | 3        | 4    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 20-50    | 15-25              | 10-15    | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | 5-10     | 20-30              | ---      | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | 2-10               | ---      | ---      | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | 10-15    | 5-15     | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-3      | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | 10-15              | 5-20     | ---      | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | 2-4      | ---                | ---      | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | 2-4      | 2-5                | ---      | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | 2-5                | ---      | 2-8      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 15-20    | ---                | ---      | ---      | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | 2-5      | ---                | ---      | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | ---                | ---      | 2-5      | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | 10-15              | ---      | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | 25-35    | ---      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | ---      | 30-40    | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | ---                | ---      | 20-30    | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 2-10     | 5-10               | 5-35     | ---      | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X005N | 025X014N           | 024X030N | 024X002N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 800                                                                                        | 800      | 800      | 1,000              | 500      | 700      | ---  |
| Normal years                    |              | 600                                                                                        | 600      | 600      | 800                | 350      | 450      | ---  |
| Unfavorable years               |              | 400                                                                                        | 400      | 400      | 600                | 250      | 300      | ---  |

## 2798--Old Camp-Atlow-Osoll association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Old Camp                                                                                   | Atlow    | Osoll    | 1                  | 2        | 3        | 4    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 10-15    | ---      | 10-15              | 5-10     | 15-25    | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | ---      | ---                | ---      | 20-30    | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | 10-15    | 5-15     | 10-15              | 15-30    | ---      | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10     | ---      | 2-10               | ---      | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3      | ---                | ---      | ---      | ---  |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---      | ---                | T-2      | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-20     | ---      | 5-20               | 5-15     | 10-15    | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---      | ---                | ---      | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | 2-5      | ---      | 2-5                | 2-4      | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8      | ---                | ---      | 2-5      | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | ---      | ---                | 15-30    | ---      | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---      | 2-5      | ---                | 2-5      | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | 25-35    | ---      | 25-35              | ---      | ---      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40    | ---                | 2-5      | ---      | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30    | ---                | ---      | ---      | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 5-35     | ---      | 5-35               | 2-5      | 5-10     | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X030N | 024X002N | 024X030N           | 024X045N | 025X014N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 800                                                                                        | 500      | 700      | 500                | 350      | 1,000    | ---  |
| Normal years                    |              | 600                                                                                        | 350      | 450      | 350                | 200      | 800      | ---  |
| Unfavorable years               |              | 400                                                                                        | 250      | 300      | 250                | 100      | 600      | ---  |

## 2800--Old Camp-Walti-Softscrabble association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |      |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|------|------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |      |      |          |
|                                 |              | Old Camp                                                                                   | Walti    | Softscrabble | 1                  | 2    | 3    | 4        |
| Bluebunch wheatgrass            | AGSP         | 15-25                                                                                      | 15-30    | 20-30        | ---                | ---  | ---  | 5-15     |
| Thurber needlegrass             | STTH2        | 15-25                                                                                      | 2-10     | 2-10         | ---                | ---  | ---  | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | 25-50    | 20-40        | 10-20              | ---  | ---  | 5-15     |
| Spike fescue                    | HEKI         | ---                                                                                        | 2-10     | ---          | ---                | ---  | ---  | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 2-15         | ---                | ---  | ---  | 2-5      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---          | 5-10               | ---  | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---          | 5-10               | ---  | ---  | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  | 2-5      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 5-10     |
| Slender wheatgrass              | AGTR         | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Bearded wheatgrass              | AGSU         | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Letterman needlegrass           | STLE4        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Other perennial grasses         | PPGG         | 10-20                                                                                      | ---      | ---          | ---                | ---  | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | ---      | 1-5          | ---                | ---  | ---  | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | 1-5          | ---                | ---  | ---  | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5      | ---          | ---                | ---  | ---  | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  | ---      |
| Other perennial forbs           | PPFF         | 2-10                                                                                       | ---      | ---          | ---                | ---  | ---  | 5-15     |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | ---      | ---          | ---                | ---  | ---  | ---      |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | ---      | 5-15         | ---                | ---  | ---  | 5-10     |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 10-20    | ---          | 5-15               | ---  | ---  | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | 2-5      | ---          | ---                | ---  | ---  | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---          | 5-15               | ---  | ---  | ---      |
| Serviceberry                    | AMELA        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 5-10     |
| Oceanspray                      | HOLOD        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 5-10     |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-10     |
| Threetip sagebrush              | ARTR4        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-10     |
| Currant                         | RIBES        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---          | ---                | ---  | ---  | ---      |
| Range site number               |              | 024X035N                                                                                   | 024X027N | 024X021N     | 024X016N           | None | None | 024X034N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |      |      |          |
| Favorable years                 |              | 500                                                                                        | 1,200    | 1,400        | 350                | ---  | ---  | 1,600    |
| Normal years                    |              | 400                                                                                        | 800      | 1,000        | 250                | ---  | ---  | 1,300    |
| Unfavorable years               |              | 250                                                                                        | 600      | 700          | 150                | ---  | ---  | 800      |

## 2801--Old Camp-Rock outcrop-Colbar association, strongly sloping

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |              |          | Inclusion number-- |          |          |
|                                 |              | Old Camp                                                                                   | Rock outcrop | Colbar   | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---          | 20-50    | 2-5                | ---      | 20-50    |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---          | ---      | 2-10               | 5-15     | ---      |
| Bluebunch wheatgrass            | AGSP         | 2-10                                                                                       | ---          | 5-10     | ---                | ---      | 5-10     |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | ---          | ---      | 2-10               | 5-15     | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---          | ---      | 2-10               | ---      | ---      |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---          | ---      | 2-5                | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---          | ---      | 2-5                | 2-5      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---          | ---      | 2-5                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---          | ---      | ---                | 1-3      | ---      |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---          | ---      | 1-2                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---          | 2-4      | ---                | ---      | 2-4      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---          | 2-4      | ---                | ---      | 2-4      |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---          | ---      | 1-2                | ---      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---          | ---      | ---                | 2-8      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-25                                                                                      | ---          | 15-20    | 10-25              | ---      | 15-20    |
| Ephedra                         | EPHED        | 2-10                                                                                       | ---          | ---      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-10                                                                                       | ---          | 2-5      | 5-15               | 2-5      | 2-5      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---          | 2-5      | 2-5                | ---      | 2-5      |
| Shadscale                       | ATCO         | 2-5                                                                                        | ---          | ---      | 10-25              | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---          | ---      | 2-5                | 20-30    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---          | ---      | ---                | 2-5      | ---      |
| Range site number               |              | 024X047N                                                                                   | None         | 024X005N | 024X026N           | 024X002N | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |              |          |                    |          |          |
| Favorable years                 |              | 400                                                                                        | ---          | 800      | 400                | 700      | 800      |
| Normal years                    |              | 300                                                                                        | ---          | 600      | 300                | 450      | 600      |
| Unfavorable years               |              | 150                                                                                        | ---          | 400      | 200                | 300      | 400      |

## 2802--Old Camp-Rock outcrop-Colbar association, steep

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |          |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|----------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |              |          | Inclusion number-- |      |          |
|                                 |              | Old Camp                                                                                   | Rock outcrop | Colbar   | 1                  | 2    | 3        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---          | 20-50    | 2-5                | ---  | ---      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---          | ---      | 2-10               | ---  | ---      |
| Bluebunch wheatgrass            | AGSP         | 2-10                                                                                       | ---          | 5-10     | ---                | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | ---          | ---      | 2-10               | ---  | 5-10     |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---          | ---      | 2-10               | ---  | ---      |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---          | ---      | 2-5                | ---  | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---          | ---      | 2-5                | ---  | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---          | ---      | 2-5                | ---  | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---          | ---      | ---                | ---  | T-10     |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---          | ---      | 1-2                | ---  | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---          | 2-4      | ---                | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---          | 2-4      | ---                | ---  | ---      |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---          | ---      | 1-2                | ---  | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---          | ---      | ---                | ---  | 2-8      |
| Wyoming big sagebrush           | ARTRW*       | 15-25                                                                                      | ---          | 15-20    | 10-25              | ---  | ---      |
| Ephedra                         | EPHED        | 2-10                                                                                       | ---          | ---      | ---                | ---  | ---      |
| Spiny hopsage                   | GRSP         | 2-10                                                                                       | ---          | 2-5      | 5-15               | ---  | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---          | 2-5      | 2-5                | ---  | ---      |
| Shadscale                       | ATCO         | 2-5                                                                                        | ---          | ---      | 10-25              | ---  | 30-50    |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---          | ---      | 2-5                | ---  | 5-15     |
| Black greasewood                | SAVE4        | ---                                                                                        | ---          | ---      | ---                | ---  | 15-30    |
| Seepweed                        | SUAED        | ---                                                                                        | ---          | ---      | ---                | ---  | 2-15     |
| Range site number               |              | 024X047N                                                                                   | None         | 024X005N | 024X026N           | None | 024X003N |
| Potential production (lb/acre): |              |                                                                                            |              |          |                    |      |          |
| Favorable years                 |              | 400                                                                                        | ---          | 800      | 400                | ---  | 600      |
| Normal years                    |              | 300                                                                                        | ---          | 600      | 300                | ---  | 450      |
| Unfavorable years               |              | 150                                                                                        | ---          | 400      | 200                | ---  | 300      |



## 3071--Allor-Wieland association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Allor                                                                                      | Wieland  | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 20-30                                                                                      | 20-30    | ---                | 20-30    | 20-30    |
| Needleandthread                 | STCO4        | 10-20                                                                                      | 10-20    | ---                | 10-20    | 10-20    |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10     | ---                | 5-10     | 5-10     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---                | 2-5      | 2-5      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 30-50              | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 15-25              | ---      | ---      |
| Perennial forbs                 | PPFF         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      | 2-5      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---                | 15-20    | 15-20    |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 5-10               | ---      | ---      |
| Other shrubs                    | SSSS         | 5-15                                                                                       | 5-15     | 5-10               | 5-15     | 5-15     |
| Range site number               |              | 028B010N                                                                                   | 028B010N | 028B003N           | 028B010N | 028B010N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 2,600              | 800      | 800      |
| Normal years                    |              | 600                                                                                        | 600      | 1,250              | 600      | 600      |
| Unfavorable years               |              | 400                                                                                        | 400      | 800                | 400      | 400      |

## 3111--Ninemile-Zoesta-Itca association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Ninemile                                                                                   | Zoesta   | Itca     | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 5-15                                                                                       | 2-5      | 10-20    | ---                | ---      | 1-3      |
| Pine bluegrass                  | POSC         | 5-10                                                                                       | ---      | ---      | ---                | ---      | 2-5      |
| Thurber needlegrass             | STTH2        | 2-5                                                                                        | 5-15     | ---      | ---                | ---      | ---      |
| Indian ricegrass                | ORHY         | 2-5                                                                                        | 5-10     | ---      | ---                | ---      | 5-15     |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 5-10     | ---      | ---                | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | 15-25    | ---                | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 2-10     | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | 30-50    | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Other perennial grasses         | PPGG         | 10-15                                                                                      | ---      | 2-5      | ---                | 15-25    | 5-10     |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | 10-15                                                                                      | 5-10     | 2-10     | ---                | 2-5      | 5-15     |
| Low sagebrush                   | ARAR8        | 25-30                                                                                      | 25-30    | ---      | ---                | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | ---      | 20-25    |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | 10-20                                                                                      | 10-15    | 5-15     | ---                | 5-10     | 10-20    |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Range site number               |              | 028B037N                                                                                   | 028B045N | 025X061N | None               | 028B003N | 028B016N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 800      | 500      | ---                | 2,600    | 500      |
| Normal years                    |              | 500                                                                                        | 600      | 375      | ---                | 1,250    | 250      |
| Unfavorable years               |              | 300                                                                                        | 400      | 250      | ---                | 800      | 150      |

## 3121--Walti-Softscrabble-Bucan association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |          |                    |      |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|----------|--------------------|------|----------|----------|
|                                 |              | Soil name                                                                                  |              |          | Inclusion number-- |      |          |          |
|                                 |              | Walti                                                                                      | Softscrabble | Bucan    | 1                  | 2    | 3        | 4        |
| Idaho fescue                    | FEID         | 25-50                                                                                      | 20-40        | ---      | ---                | ---  | X        | ---      |
| Bluebunch wheatgrass            | AGSP         | 15-30                                                                                      | 20-30        | 40-60    | ---                | ---  | ---      | ---      |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | 2-10         | 5-10     | ---                | ---  | ---      | ---      |
| Spike fescue                    | HEKI         | 2-10                                                                                       | ---          | ---      | ---                | ---  | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-15         | 2-5      | 50-60              | ---  | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---          | 2-10     | ---                | ---  | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---          | ---      | 5-15               | ---  | ---      | 5-10     |
| Mat muhly                       | MURI         | ---                                                                                        | ---          | ---      | 2-10               | ---  | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---          | ---      | 1-5                | ---  | ---      | 5-10     |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Slender wheatgrass              | AGTR         | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Bulbous oniongrass              | MEBU         | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Tufted hairgrass                | DECA5        | ---                                                                                        | ---          | ---      | ---                | ---  | ---      | 30-60    |
| Alpine timothy                  | PHAL2        | ---                                                                                        | ---          | ---      | ---                | ---  | ---      | 5-10     |
| Meadow barley                   | HOBR2        | ---                                                                                        | ---          | ---      | ---                | ---  | ---      | 2-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---          | ---      | 15-20              | ---  | X        | 2-10     |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---          | ---      | ---                | ---  | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-5          | 2-5      | ---                | ---  | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 1-5          | 2-5      | ---                | ---  | ---      | ---      |
| Horsemint                       | AGUR         | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Columbine                       | AQUIL        | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Meadowrue                       | THALI2       | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Geranium                        | GERAN        | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Sweet cicely                    | OSMOR        | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | ---          | ---      | ---                | ---  | ---      | 2-5      |
| Cinquefoil                      | POTEN        | ---                                                                                        | ---          | ---      | ---                | ---  | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---          | ---      | 5-10               | ---  | X        | 10-20    |
| Low sagebrush                   | ARAR8        | 10-20                                                                                      | ---          | ---      | ---                | ---  | ---      | ---      |
| Douglas rabbitbrush             | CHVI8        | 2-5                                                                                        | ---          | ---      | ---                | ---  | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-15         | T-5      | ---                | ---  | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---          | 5-10     | ---                | ---  | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---          | ---      | 10-15              | ---  | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Currant                         | RIBES        | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---          | ---      | ---                | ---  | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---          | ---      | 2-5                | ---  | X        | 2-5      |
| Quaking aspen                   | POTR5        | ---                                                                                        | ---          | ---      | ---                | ---  | X        | ---      |
| Range site number               |              | 024X027N                                                                                   | 024X021N     | 024X028N | 025X003N           | None | 025X065N | 025X005N |
| Potential production (lb/acre): |              |                                                                                            |              |          |                    |      |          |          |
| Favorable years                 |              | 1,200                                                                                      | 1,400        | 1,000    | 2,500              | ---  | 800      | 2,000    |
| Normal years                    |              | 800                                                                                        | 1,000        | 700      | 1,900              | ---  | 600      | 1,700    |
| Unfavorable years               |              | 600                                                                                        | 700          | 500      | 1,200              | ---  | 400      | 1,000    |

## 3122--Walti-Sumine-Softscrabble association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |      |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|------|------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |      |      |          |
|                                 |              | Walti                                                                                      | Sumine   | Softscrabble | 1                  | 2    | 3    | 4        |
| Idaho fescue                    | FEID         | 25-50                                                                                      | 1-10     | 20-40        | ---                | ---  | ---  | 10-20    |
| Bluebunch wheatgrass            | AGSP         | 15-30                                                                                      | 20-50    | 20-30        | ---                | ---  | ---  | ---      |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | 2-5      | 2-10         | ---                | ---  | ---  | ---      |
| Spike fescue                    | HEKI         | 2-10                                                                                       | ---      | ---          | ---                | ---  | ---  | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 5-10     | 2-15         | 50-60              | ---  | ---  | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | 2-15     | ---          | ---                | ---  | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-5      | ---          | ---                | ---  | ---  | 5-10     |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | 5-15               | ---  | ---  | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---          | 2-10               | ---  | ---  | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---          | 1-5                | ---  | ---  | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 5-10     |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---          | 15-20              | ---  | ---  | ---      |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | ---          | ---                | ---  | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | 1-5          | ---                | ---  | ---  | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | 1-5          | ---                | ---  | ---  | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---          | 5-10               | ---  | ---  | ---      |
| Low sagebrush                   | ARAR8        | 10-20                                                                                      | ---      | ---          | ---                | ---  | ---  | 5-15     |
| Douglas rabbitbrush             | CHVI8        | 2-5                                                                                        | ---      | ---          | ---                | ---  | ---  | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-15     | 5-15         | ---                | ---  | ---  | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---          | 10-15              | ---  | ---  | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---          | ---                | ---  | ---  | 5-15     |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  | ---      |
| Range site number               |              | 024X027N                                                                                   | 024X029N | 024X021N     | 025X003N           | None | None | 024X016N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |      |      |          |
| Favorable years                 |              | 1,200                                                                                      | 1,500    | 1,400        | 2,500              | ---  | ---  | 350      |
| Normal years                    |              | 800                                                                                        | 1,100    | 1,000        | 1,900              | ---  | ---  | 250      |
| Unfavorable years               |              | 600                                                                                        | 800      | 700          | 1,200              | ---  | ---  | 150      |

## 3127--Walti-Cleavage-Softscrabble association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name        | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |       |       |     |
|--------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|-------|-------|-----|
|                          |              | Soil name                                                                                  |          |              | Inclusion number-- |       |       |     |
|                          |              | Walti                                                                                      | Cleavage | Softscrabble | 1                  | 2     | 3     | 4   |
| Idaho fescue             | FEID         | 25-50                                                                                      | 10-20    | 20-40        | ---                | ---   | 15-25 | --- |
| Bluebunch wheatgrass     | AGSP         | 15-30                                                                                      | ---      | 20-30        | 20-30              | ---   | 10-20 | --- |
| Thurber needlegrass      | STTH2        | 2-10                                                                                       | ---      | 2-10         | 15-25              | ---   | ---   | --- |
| Spike fescue             | HEKI         | 2-10                                                                                       | ---      | ---          | ---                | ---   | ---   | --- |
| Webber ricegrass         | ORWE         | ---                                                                                        | 5-10     | ---          | ---                | ---   | ---   | --- |
| Bottlebrush squirreltail | SIHY         | ---                                                                                        | 5-10     | ---          | ---                | ---   | ---   | --- |
| Cusick bluegrass         | POCU3        | ---                                                                                        | 2-5      | ---          | ---                | ---   | ---   | --- |
| Sandberg bluegrass       | POSE         | ---                                                                                        | 2-5      | ---          | ---                | ---   | ---   | --- |
| Pine bluegrass           | POSC         | ---                                                                                        | 2-5      | ---          | ---                | ---   | ---   | --- |
| Basin wildrye            | ELCI2        | ---                                                                                        | ---      | 2-15         | ---                | 50-60 | ---   | --- |
| Nevada bluegrass         | PONE3        | ---                                                                                        | ---      | ---          | 2-10               | 5-15  | ---   | --- |
| Mat muhly                | MURI         | ---                                                                                        | ---      | ---          | ---                | 2-10  | ---   | --- |
| Sedge                    | CAREX        | ---                                                                                        | ---      | ---          | ---                | 1-5   | ---   | --- |
| Bluegrass                | POA++        | ---                                                                                        | ---      | ---          | ---                | ---   | 2-10  | --- |
| Other perennial grasses  | PPGG         | ---                                                                                        | ---      | ---          | 10-15              | 15-20 | 2-5   | --- |
| Balsamroot               | BALSA        | 2-5                                                                                        | ---      | ---          | ---                | ---   | ---   | --- |
| Goldenweed               | HAPLO2       | ---                                                                                        | 2-5      | ---          | ---                | ---   | ---   | --- |
| Phlox                    | PHLOX        | ---                                                                                        | 2-5      | ---          | ---                | ---   | ---   | --- |
| Tapertip hawksbeard      | CRAC2        | ---                                                                                        | ---      | 1-5          | 2-5                | ---   | 2-5   | --- |
| Arrowleaf balsamroot     | BASA3        | ---                                                                                        | ---      | 1-5          | 2-5                | ---   | 2-5   | --- |
| Other perennial forbs    | PPFF         | ---                                                                                        | ---      | ---          | 2-5                | 5-10  | 2-10  | --- |
| Low sagebrush            | ARAR8        | 10-20                                                                                      | 5-15     | ---          | ---                | ---   | ---   | --- |
| Douglas rabbitbrush      | CHVI8        | 2-5                                                                                        | ---      | ---          | ---                | ---   | ---   | --- |
| Black sagebrush          | ARARN        | ---                                                                                        | 5-15     | ---          | ---                | ---   | ---   | --- |
| Mountain big sagebrush   | ARTRV        | ---                                                                                        | ---      | 5-15         | ---                | ---   | ---   | --- |
| Big sagebrush            | ARTR2        | ---                                                                                        | ---      | ---          | 10-15              | ---   | 5-10  | --- |
| Basin big sagebrush      | ARTRT*       | ---                                                                                        | ---      | ---          | ---                | 10-15 | ---   | --- |
| Other shrubs             | SSSS         | ---                                                                                        | ---      | ---          | 5-10               | 2-5   | 5-15  | --- |
| Singleleaf pinyon        | PIMO         | ---                                                                                        | ---      | ---          | ---                | ---   | 2-5   | --- |

| Range site number               | 024X027N | 024X016N | 024X021N | 025X014N | 025X003N | 025X061N | None |
|---------------------------------|----------|----------|----------|----------|----------|----------|------|
| Potential production (lb/acre): |          |          |          |          |          |          |      |
| Favorable years                 | 1,200    | 350      | 1,400    | 1,000    | 2,500    | 500      | ---  |
| Normal years                    | 800      | 250      | 1,000    | 800      | 1,900    | 375      | ---  |
| Unfavorable years               | 600      | 150      | 700      | 600      | 1,200    | 250      | ---  |

## 3134--Itca-Clanlaine-Sumine association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |          |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|----------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |           |          | Inclusion number-- |          |          |          |
|                                 |              | Itca                                                                                       | Clanlaine | Sumine   | 1                  | 2        | 3        | 4        |
| Idaho fescue                    | FEID         | 15-25                                                                                      | 15-25     | 1-10     | ---                | 20-40    | 25-50    | ---      |
| Bluebunch wheatgrass            | AGSP         | 10-20                                                                                      | 10-20     | 20-50    | ---                | 20-30    | 15-30    | 2-5      |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10      | ---      | ---                | ---      | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---       | 5-10     | ---                | 2-15     | ---      | 10-20    |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---       | 2-15     | ---                | ---      | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---       | 2-5      | ---                | 2-10     | 2-10     | 2-5      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---       | 2-5      | ---                | ---      | ---      | 2-5      |
| Spike fescue                    | HEKI         | ---                                                                                        | ---       | ---      | ---                | ---      | 2-10     | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---       | ---      | ---                | ---      | ---      | 5-10     |
| Other perennial grasses         | PPGG         | 2-5                                                                                        | 2-5       | ---      | ---                | ---      | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-5       | 2-5      | ---                | 1-5      | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | 2-5       | 2-5      | ---                | 1-5      | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---       | ---      | ---                | ---      | 2-5      | ---      |
| Other perennial forbs           | PPFF         | 2-10                                                                                       | 2-10      | ---      | ---                | ---      | ---      | 2-5      |
| Big sagebrush                   | ARTR2        | 5-10                                                                                       | 5-10      | ---      | ---                | ---      | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---       | 5-15     | ---                | 5-15     | ---      | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---       | ---      | ---                | ---      | 10-20    | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---       | ---      | ---                | ---      | 2-5      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---       | ---      | ---                | ---      | ---      | 10-20    |
| Woods rose                      | ROWO         | ---                                                                                        | ---       | ---      | ---                | ---      | ---      | 2-5      |
| Common chokecherry              | PRVI         | ---                                                                                        | ---       | ---      | ---                | ---      | ---      | 2-5      |
| Green ephedra                   | EPVI         | ---                                                                                        | ---       | ---      | ---                | ---      | ---      | 2-5      |
| Other shrubs                    | SSSS         | 5-15                                                                                       | 5-15      | ---      | ---                | ---      | ---      | 5-10     |
| Singleleaf pinyon               | PIMO         | 2-5                                                                                        | 2-5       | ---      | ---                | ---      | ---      | ---      |
| Range site number               |              | 025X061N                                                                                   | 025X061N  | 024X029N | None               | 024X021N | 024X027N | 028B006N |
| Potential production (lb/acre): |              |                                                                                            |           |          |                    |          |          |          |
| Favorable years                 |              | 500                                                                                        | 500       | 1,500    | ---                | 1,400    | 1,200    | 1,000    |
| Normal years                    |              | 375                                                                                        | 375       | 1,100    | ---                | 1,000    | 800      | 600      |
| Unfavorable years               |              | 250                                                                                        | 250       | 800      | ---                | 700      | 600      | 400      |

## 3150--Robson-Wiskan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |      |          |
|                                 |              | Robson                                                                                     | Wiskan   | 1                  | 2    | 3        |
| Bluebunch wheatgrass            | AGSP         | 15-20                                                                                      | 10-20    | 15-30              | ---  | ---      |
| Thurber needlegrass             | STTH2        | 15-20                                                                                      | 5-15     | 2-10               | ---  | ---      |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---      | ---                | ---  | 5-10     |
| Sandberg bluegrass              | POSE         | 5-8                                                                                        | ---      | ---                | ---  | 2-5      |
| Pine bluegrass                  | POSC         | 5-8                                                                                        | ---      | ---                | ---  | 2-5      |
| Cusick bluegrass                | POCU3        | 5-8                                                                                        | ---      | ---                | ---  | 2-5      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 2-10     | ---                | ---  | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10     | ---                | ---  | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | 25-50              | ---  | 10-20    |
| Spike fescue                    | HEKI         | ---                                                                                        | ---      | 2-10               | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---                | ---  | 5-10     |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | 2-5                | ---  | ---      |
| Eriogonum                       | ERIOG        | 1-3                                                                                        | ---      | ---                | ---  | ---      |
| Phlox                           | PHLOX        | 1-3                                                                                        | ---      | ---                | ---  | 2-5      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | ---                | ---  | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---                | ---  | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 5-15     | ---                | ---  | ---      |
| Low sagebrush                   | ARAR8        | 20-30                                                                                      | ---      | 10-20              | ---  | 5-15     |
| Black sagebrush                 | ARARN        | ---                                                                                        | 15-30    | ---                | ---  | 5-15     |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---      | 2-5                | ---  | ---      |
| Range site number               |              | 024X018N                                                                                   | 024X031N | 024X027N           | None | 024X016N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |      |          |
| Favorable years                 |              | 700                                                                                        | 700      | 1,200              | ---  | 350      |
| Normal years                    |              | 500                                                                                        | 500      | 800                | ---  | 250      |
| Unfavorable years               |              | 300                                                                                        | 300      | 600                | ---  | 150      |

## 3152--Robson-Reluctan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Robson                                                                                     | Reluctan | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 15-20                                                                                      | 20-30    | ---                | 10-20    | 40-60    |
| Thurber needlegrass             | STTH2        | 15-20                                                                                      | 2-10     | ---                | 5-15     | 5-10     |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---      | ---                | ---      | ---      |
| Sandberg bluegrass              | POSE         | 5-8                                                                                        | ---      | ---                | ---      | ---      |
| Pine bluegrass                  | POSC         | 5-8                                                                                        | ---      | ---                | ---      | ---      |
| Cusick bluegrass                | POCU3        | 5-8                                                                                        | ---      | ---                | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | 20-40    | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-15     | 50-60              | ---      | 2-5      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 5-15               | ---      | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | 2-10               | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | 1-5                | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---                | 2-10     | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---                | 2-10     | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 15-20              | ---      | ---      |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | ---                | ---      | ---      |
| Eriogonum                       | ERIOG        | 1-3                                                                                        | ---      | ---                | ---      | ---      |
| Phlox                           | PHLOX        | 1-3                                                                                        | ---      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-5      | ---                | 2-5      | 2-5      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 1-5      | ---                | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 5-10               | 5-15     | ---      |
| Low sagebrush                   | ARAR8        | 20-30                                                                                      | ---      | ---                | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-15     | ---                | ---      | T-5      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 10-15              | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---                | 15-30    | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---                | ---      | 5-10     |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-5                | ---      | ---      |
| Range site number               |              | 024X018N                                                                                   | 024X021N | 025X003N           | 024X031N | 024X028N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 1,400    | 2,500              | 700      | 1,000    |
| Normal years                    |              | 500                                                                                        | 1,000    | 1,900              | 500      | 700      |
| Unfavorable years               |              | 300                                                                                        | 700      | 1,200              | 300      | 500      |



## 3156--Robson-Old Camp-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |
|                                 |              | Robson                                                                                     | Old Camp | Rock outcrop | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 15-20                                                                                      | 5-10     | ---          | 40-60              | 15-20    | ---      |
| Thurber needlegrass             | STTH2        | 15-20                                                                                      | 20-50    | ---          | 5-10               | 15-20    | ---      |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---      | ---          | ---                | 5-10     | ---      |
| Sandberg bluegrass              | POSE         | 5-8                                                                                        | ---      | ---          | ---                | 5-8      | ---      |
| Pine bluegrass                  | POSC         | 5-8                                                                                        | ---      | ---          | ---                | 5-8      | ---      |
| Cusick bluegrass                | POCU3        | 5-8                                                                                        | ---      | ---          | ---                | 5-8      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---          | 2-10               | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---          | 2-5                | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---          | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---          | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---          | ---                | ---      | 15-20    |
| Balsamroot                      | BALSA        | 2-5                                                                                        | 2-4      | ---          | ---                | 2-5      | ---      |
| Eriogonum                       | ERIOG        | 1-3                                                                                        | ---      | ---          | ---                | 1-3      | ---      |
| Phlox                           | PHLOX        | 1-3                                                                                        | ---      | ---          | ---                | 1-3      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---          | 2-5                | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---          | 2-5                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---          | ---                | ---      | 5-10     |
| Low sagebrush                   | ARAR8        | 20-30                                                                                      | ---      | ---          | ---                | 20-30    | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---          | 5-10               | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | ---          | T-5                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---          | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---          | ---                | ---      | 2-5      |
| Range site number               |              | 024X018N                                                                                   | 024X005N | None         | 024X028N           | 024X018N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 800      | ---          | 1,000              | 700      | 2,500    |
| Normal years                    |              | 500                                                                                        | 600      | ---          | 700                | 500      | 1,900    |
| Unfavorable years               |              | 300                                                                                        | 400      | ---          | 500                | 300      | 1,200    |

## 3203--Dewar-Sodhouse-Bojo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Dewar                                                                                      | Sodhouse | Bojo     | 1                  | 2        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | ---      | 10-20    | ---                | 10-20    |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | ---      | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15     | 2-10     | ---                | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | 5-15     | 5-15     | ---                | 5-15     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | 2-10     | ---                | 2-10     |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | ---      | ---                | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---      | ---                | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | 1-2      | ---                | 1-2      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2      | ---                | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2      | ---                | 1-2      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | ---      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 30-35    | ---                | 30-35    |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | ---      | ---                | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15     | ---                | 5-15     |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | ---      | ---                | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | ---      | ---                | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---      | ---                | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---      | ---                | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X002N | 024X020N | None               | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 800                                                                                        | 700      | 700      | ---                | 700      |
| Normal years                    |              | 600                                                                                        | 450      | 450      | ---                | 450      |
| Unfavorable years               |              | 400                                                                                        | 300      | 300      | ---                | 300      |

## 3410--Zoesta-Wieland-Akerue association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |
|                                 |              | Zoesta                                                                                     | Wieland  | Akerue   | 1                  | 2        | 3    |
| Bluebunch wheatgrass            | AGSP         | 15-20                                                                                      | 5-10     | ---      | 40-60              | 5-10     | ---  |
| Thurber needlegrass             | STTH2        | 15-20                                                                                      | 20-50    | 10-15    | 5-10               | 20-50    | ---  |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---      | ---      | ---                | ---      | ---  |
| Sandberg bluegrass              | POSE         | 5-8                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Pine bluegrass                  | POSC         | 5-8                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Cusick bluegrass                | POCU3        | 5-8                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 10-15    | ---                | ---      | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 2-10     | 2-10               | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 5-20     | ---                | ---      | ---  |
| Balsamroot                      | BALSA        | 2-5                                                                                        | 2-4      | ---      | ---                | 2-4      | ---  |
| Eriogonum                       | ERIOG        | 1-3                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Phlox                           | PHLOX        | 1-3                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---      | 2-5                | 2-4      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  |
| Low sagebrush                   | ARAR8        | 20-30                                                                                      | ---      | ---      | ---                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---      | 5-10               | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---      | ---                | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | ---      | ---                | 2-5      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 25-35    | ---                | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | ---      | T-5                | ---      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | 5-35     | ---                | 2-10     | ---  |
| Range site number               |              | 024X018N                                                                                   | 024X005N | 024X030N | 024X028N           | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |
| Favorable years                 |              | 700                                                                                        | 800      | 500      | 1,000              | 800      | ---  |
| Normal years                    |              | 500                                                                                        | 600      | 350      | 700                | 600      | ---  |
| Unfavorable years               |              | 300                                                                                        | 400      | 250      | 500                | 400      | ---  |

## 3413--Zoesta-Reluctan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |      |
|                                 |              | Zoesta                                                                                     | Reluctan | 1                  | 2        | 3    |
| Bluebunch wheatgrass            | AGSP         | 15-20                                                                                      | 20-30    | 40-60              | 20-30    | ---  |
| Thurber needlegrass             | STTH2        | 15-20                                                                                      | 2-10     | 5-10               | 2-10     | ---  |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---      | ---                | ---      | ---  |
| Sandberg bluegrass              | POSE         | 5-8                                                                                        | ---      | ---                | ---      | ---  |
| Pine bluegrass                  | POSC         | 5-8                                                                                        | ---      | ---                | ---      | ---  |
| Cusick bluegrass                | POCU3        | 5-8                                                                                        | ---      | ---                | ---      | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | 20-40    | ---                | 20-40    | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-15     | 2-5                | 2-15     | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 2-10               | ---      | ---  |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | ---                | ---      | ---  |
| Eriogonum                       | ERIOG        | 1-3                                                                                        | ---      | ---                | ---      | ---  |
| Phlox                           | PHLOX        | 1-3                                                                                        | ---      | ---                | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-5      | 2-5                | 1-5      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 1-5      | 2-5                | 1-5      | ---  |
| Low sagebrush                   | ARAR8        | 20-30                                                                                      | ---      | ---                | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-15     | T-5                | 5-15     | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 5-10               | ---      | ---  |
| Range site number               |              | 024X018N                                                                                   | 024X021N | 024X028N           | 024X021N | None |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |      |
| Favorable years                 |              | 700                                                                                        | 1,400    | 1,000              | 1,400    | ---  |
| Normal years                    |              | 500                                                                                        | 1,000    | 700                | 1,000    | ---  |
| Unfavorable years               |              | 300                                                                                        | 700      | 500                | 700      | ---  |

## 3415--Zoesta-Handy association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Zoesta                                                                                     | Handy    | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 15-20                                                                                      | 20-30    | 20-30              | ---      | 15-20    |
| Thurber needlegrass             | STTH2        | 15-20                                                                                      | 15-25    | 15-25              | ---      | 15-20    |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---      | ---                | ---      | 5-10     |
| Sandberg bluegrass              | POSE         | 5-8                                                                                        | ---      | ---                | ---      | 5-8      |
| Pine bluegrass                  | POSC         | 5-8                                                                                        | ---      | ---                | ---      | 5-8      |
| Cusick bluegrass                | POCU3        | 5-8                                                                                        | ---      | ---                | ---      | 5-8      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 2-10     | 2-10               | 5-15     | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | 50-60    | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---                | 2-10     | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---                | 1-5      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-15    | 10-15              | 15-20    | ---      |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | ---                | ---      | 2-5      |
| Eriogonum                       | ERIOG        | 1-3                                                                                        | ---      | ---                | ---      | 1-3      |
| Phlox                           | PHLOX        | 1-3                                                                                        | ---      | ---                | ---      | 1-3      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | 2-5                | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | 2-5                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-5      | 2-5                | 5-10     | ---      |
| Low sagebrush                   | ARAR8        | 20-30                                                                                      | ---      | ---                | ---      | 20-30    |
| Big sagebrush                   | ARTR2        | ---                                                                                        | 10-15    | 10-15              | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | 10-15    | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-10     | 5-10               | 2-5      | ---      |
| Range site number               |              | 024X018N                                                                                   | 025X014N | 025X014N           | 025X003N | 024X018N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 1,000    | 1,000              | 2,500    | 700      |
| Normal years                    |              | 500                                                                                        | 800      | 800                | 1,900    | 500      |
| Unfavorable years               |              | 300                                                                                        | 600      | 600                | 1,200    | 300      |

## 3417--Zoesta-Loncan-Welch association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |          |
|                                 |              | Zoesta                                                                                     | Loncan   | Welch    | 1                  | 2        | 3        | 4        |
| Bluebunch wheatgrass            | AGSP         | 15-20                                                                                      | 20-30    | ---      | ---                | 20-30    | 20-30    | ---      |
| Thurber needlegrass             | STTH2        | 15-20                                                                                      | 2-10     | ---      | ---                | 2-10     | 15-25    | ---      |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---      | ---      | ---                | ---      | ---      | ---      |
| Sandberg bluegrass              | POSE         | 5-8                                                                                        | ---      | ---      | ---                | ---      | ---      | ---      |
| Pine bluegrass                  | POSC         | 5-8                                                                                        | ---      | ---      | ---                | ---      | ---      | ---      |
| Cusick bluegrass                | POCU3        | 5-8                                                                                        | ---      | ---      | ---                | ---      | ---      | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | 20-40    | ---      | ---                | 20-40    | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-15     | 50-60    | 5-15               | 2-15     | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 5-15     | 40-60              | ---      | 2-10     | 5-10     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | 2-10     | 5-15               | ---      | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | 1-5      | 5-15               | ---      | ---      | 5-10     |
| Alpine timothy                  | PHAL2        | ---                                                                                        | ---      | ---      | 20-40              | ---      | ---      | 5-10     |
| Meadow barley                   | HOBR2        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | 2-5      |
| Tufted hairgrass                | DECA5        | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 30-60    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 15-20    | 2-8                | ---      | 10-15    | 2-10     |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      | ---      |
| Eriogonum                       | ERIOG        | 1-3                                                                                        | ---      | ---      | ---                | ---      | ---      | ---      |
| Phlox                           | PHLOX        | 1-3                                                                                        | ---      | ---      | ---                | ---      | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 1-5      | ---      | ---                | 1-5      | 2-5      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 1-5      | ---      | ---                | 1-5      | 2-5      | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | 2-5      |
| Cinquefoil                      | POTEN        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 5-10     | 2-10               | ---      | 2-5      | 10-20    |
| Low sagebrush                   | ARAR8        | 20-30                                                                                      | ---      | ---      | ---                | ---      | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-15     | ---      | ---                | 5-15     | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | 10-15    | ---                | ---      | ---      | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | 2-5      |
| Rose                            | ROSA+        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-5      | 2-5                | ---      | 5-10     | 2-5      |
| Range site number               |              | 024X018N                                                                                   | 024X021N | 025X003N | 025X006N           | 024X021N | 025X014N | 025X005N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |          |
| Favorable years                 |              | 700                                                                                        | 1,400    | 2,500    | 1,600              | 1,400    | 1,000    | 2,000    |
| Normal years                    |              | 500                                                                                        | 1,000    | 1,900    | 1,300              | 1,000    | 800      | 1,700    |
| Unfavorable years               |              | 300                                                                                        | 700      | 1,200    | 800                | 700      | 600      | 1,000    |

## 3420--Belate-Sumine-Softscrabble association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |      |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|------|------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |      |      |
|                                 |              | Belate                                                                                     | Sumine   | Softscrabble | 1                  | 2    | 3    |
| Idaho fescue                    | FEID         | 25-50                                                                                      | 1-10     | 20-40        | 10-20              | ---  | ---  |
| Bluebunch wheatgrass            | AGSP         | 15-30                                                                                      | 20-50    | 20-30        | ---                | ---  | ---  |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | 2-5      | 2-10         | ---                | ---  | ---  |
| Spike fescue                    | HEKI         | 2-10                                                                                       | ---      | ---          | ---                | ---  | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 5-10     | 2-15         | ---                | ---  | ---  |
| Mountain brome                  | BRMA4        | ---                                                                                        | 2-15     | ---          | ---                | ---  | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-5      | ---          | 5-10               | ---  | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---          | 5-10               | ---  | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | ---          | ---                | ---  | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | 1-5          | ---                | ---  | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | 1-5          | ---                | ---  | ---  |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---          | 2-5                | ---  | ---  |
| Low sagebrush                   | ARAR8        | 10-20                                                                                      | ---      | ---          | 5-15               | ---  | ---  |
| Douglas rabbitbrush             | CHVI8        | 2-5                                                                                        | ---      | ---          | ---                | ---  | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-15     | 5-15         | ---                | ---  | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---          | 5-15               | ---  | ---  |
| Range site number               |              | 024X027N                                                                                   | 024X029N | 024X021N     | 024X016N           | None | None |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |      |      |
| Favorable years                 |              | 1,200                                                                                      | 1,500    | 1,400        | 350                | ---  | ---  |
| Normal years                    |              | 800                                                                                        | 1,100    | 1,000        | 250                | ---  | ---  |
| Unfavorable years               |              | 600                                                                                        | 800      | 700          | 150                | ---  | ---  |

## 3423--Belate-Cleavage-Softscrabble association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |          |
|                                 |              | Belate                                                                                     | Cleavage | Softscrabble | 1                  | 2        | 3        | 4        |
| Idaho fescue                    | FEID         | 25-50                                                                                      | 10-20    | 20-40        | ---                | 1-10     | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | 15-30                                                                                      | ---      | 20-30        | ---                | 20-50    | ---      | ---      |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | ---      | 2-10         | ---                | 2-5      | ---      | ---      |
| Spike fescue                    | HEKI         | 2-10                                                                                       | ---      | ---          | ---                | ---      | ---      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10     | ---          | ---                | ---      | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-10     | ---          | ---                | 2-5      | ---      | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 2-15         | ---                | 5-10     | 50-60    | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---          | ---                | 2-15     | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---          | ---                | ---      | 5-15     | 5-10     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---          | ---                | ---      | 2-10     | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---          | ---                | ---      | 1-5      | 5-10     |
| Tufted hairgrass                | DECA5        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 30-60    |
| Alpine timothy                  | PHAL2        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 5-10     |
| Meadow barley                   | HOB2         | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---          | ---                | ---      | 15-20    | 2-10     |
| Balsamroot                      | BALSA        | 2-5                                                                                        | ---      | ---          | ---                | ---      | ---      | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-5          | ---                | 2-5      | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 1-5          | ---                | 2-5      | ---      | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-5      |
| Cinquefoil                      | POTEN        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---          | ---                | ---      | 5-10     | 10-20    |
| Low sagebrush                   | ARAR8        | 10-20                                                                                      | 5-15     | ---          | ---                | ---      | ---      | ---      |
| Douglas rabbitbrush             | CHVI8        | 2-5                                                                                        | ---      | ---          | ---                | ---      | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | 5-15     | ---          | ---                | ---      | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | 5-15         | ---                | 5-15     | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---          | ---                | ---      | 10-15    | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---      | ---          | ---                | ---      | ---      | 2-5      |
| Range site number               |              | 024X027N                                                                                   | 024X016N | 024X021N     | None               | 024X029N | 025X003N | 025X005N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |          |
| Favorable years                 |              | 1,200                                                                                      | 350      | 1,400        | ---                | 1,500    | 2,500    | 2,000    |
| Normal years                    |              | 800                                                                                        | 250      | 1,000        | ---                | 1,100    | 1,900    | 1,700    |
| Unfavorable years               |              | 600                                                                                        | 150      | 700          | ---                | 800      | 1,200    | 1,000    |



## 3432--Bregar-Roca-Quarz association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Bregar                                                                                     | Roca     | Quarz    | 1                  | 2        |
| Idaho fescue                    | FEID         | 10-20                                                                                      | ---      | ---      | 30-60              | 30-50    |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---      | ---      | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---      | ---      | ---                | 2-5      |
| Cusick bluegrass                | POCU3        | 2-5                                                                                        | ---      | ---      | 5-10               | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | ---      | ---                | ---      |
| Pine bluegrass                  | POSC         | 2-5                                                                                        | ---      | ---      | ---                | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 40-80    | 20-30    | 2-10               | 15-30    |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 5-15     | 15-25    | ---                | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | 2-5      | ---      | ---                | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 2-5      | ---      | ---                | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 2-10     | ---                | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | 2-10     | 10-15    | ---                | 5-15     |
| Goldenweed                      | HAPLO2       | 2-5                                                                                        | ---      | ---      | ---                | ---      |
| Phlox                           | PHLOX        | 2-5                                                                                        | ---      | ---      | ---                | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | 2-5      | 2-5                | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 2-5      | ---                | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---      | ---                | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-10     | 2-5      | ---                | 5-20     |
| Low sagebrush                   | ARAR8        | 5-15                                                                                       | ---      | ---      | ---                | 10-25    |
| Black sagebrush                 | ARARN        | 5-15                                                                                       | ---      | ---      | 10-20              | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | 2-10     | 10-15    | ---                | ---      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | T-10     | ---      | ---                | 0-10     |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-8      | 5-10     | ---                | 5-15     |
| Range site number               |              | 024X016N                                                                                   | 025X015N | 025X014N | 024X042N           | 025X017N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 350                                                                                        | 1,000    | 1,000    | 1,000              | 1,000    |
| Normal years                    |              | 250                                                                                        | 700      | 800      | 800                | 700      |
| Unfavorable years               |              | 150                                                                                        | 500      | 600      | 500                | 400      |

## 3433--Bregar-Punchbowl association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |                    |      |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|--------------------|------|----------|----------|
|                                 |              | Soil name                                                                                  |           | Inclusion number-- |      |          |          |
|                                 |              | Bregar                                                                                     | Punchbowl | 1                  | 2    | 3        | 4        |
| Idaho fescue                    | FEID         | 10-20                                                                                      | ---       | 10-20              | ---  | ---      | ---      |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---       | 5-10               | ---  | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | ---       | 5-10               | ---  | ---      | ---      |
| Cusick bluegrass                | POCU3        | 2-5                                                                                        | ---       | 2-5                | ---  | ---      | ---      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---       | 2-5                | ---  | ---      | ---      |
| Pine bluegrass                  | POSC         | 2-5                                                                                        | ---       | 2-5                | ---  | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 10-15     | ---                | ---  | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 10-15     | ---                | ---  | 15-25    | 20-50    |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10      | ---                | ---  | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---       | ---                | ---  | 20-30    | 5-10     |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---       | ---                | ---  | 2-10     | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 5-20      | ---                | ---  | 10-15    | ---      |
| Goldenweed                      | HAPLO2       | 2-5                                                                                        | ---       | 2-5                | ---  | ---      | ---      |
| Phlox                           | PHLOX        | 2-5                                                                                        | ---       | 2-5                | ---  | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | 2-5       | ---                | ---  | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---       | ---                | ---  | 2-5      | 2-4      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---       | ---                | ---  | 2-5      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---       | ---                | ---  | ---      | 2-4      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---       | ---                | ---  | 2-5      | ---      |
| Low sagebrush                   | ARAR8        | 5-15                                                                                       | ---       | 5-15               | ---  | ---      | ---      |
| Black sagebrush                 | ARARN        | 5-15                                                                                       | 25-35     | 5-15               | ---  | ---      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---       | ---                | ---  | 10-15    | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---       | ---                | ---  | ---      | 15-20    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---       | ---                | ---  | ---      | 2-5      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---       | ---                | ---  | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | 5-35      | ---                | ---  | 5-10     | 2-10     |
| Range site number               |              | 024X016N                                                                                   | 024X030N  | 024X016N           | None | 025X014N | 024X005N |
| Potential production (lb/acre): |              |                                                                                            |           |                    |      |          |          |
| Favorable years                 |              | 350                                                                                        | 500       | 350                | ---  | 1,000    | 800      |
| Normal years                    |              | 250                                                                                        | 350       | 250                | ---  | 800      | 600      |
| Unfavorable years               |              | 150                                                                                        | 250       | 150                | ---  | 600      | 400      |

## 3451--Reluctan-Robson-Sumine association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |      |
|                                 |              | Reluctan                                                                                   | Robson   | Sumine   | 1                  | 2        | 3    | 4    |
| Idaho fescue                    | FEID         | 20-40                                                                                      | ---      | 1-10     | 20-40              | ---      | ---  | ---  |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | 15-20    | 20-50    | 20-30              | ---      | ---  | ---  |
| Basin wildrye                   | ELCI2        | 2-15                                                                                       | ---      | 5-10     | 2-15               | 50-60    | ---  | ---  |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | 15-20    | 2-5      | 2-10               | ---      | ---  | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10     | ---      | ---                | ---      | ---  | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 5-8      | ---      | ---                | ---      | ---  | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | 5-8      | ---      | ---                | ---      | ---  | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-8      | ---      | ---                | ---      | ---  | ---  |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | 2-15     | ---                | ---      | ---  | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---  | ---  |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---  | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | 1-5      | ---  | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | 15-20    | ---  | ---  |
| Tapertip hawksbeard             | CRAC2        | 1-5                                                                                        | ---      | 2-5      | 1-5                | ---      | ---  | ---  |
| Arrowleaf balsamroot            | BASA3        | 1-5                                                                                        | ---      | 2-5      | 1-5                | ---      | ---  | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---  | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---  | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---  | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | ---      | 5-15     | 5-15               | ---      | ---  | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 20-30    | ---      | ---                | ---      | ---  | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 10-15    | ---  | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  | ---  |
| Range site number               |              | 024X021N                                                                                   | 024X018N | 024X029N | 024X021N           | 025X003N | None | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |      |
| Favorable years                 |              | 1,400                                                                                      | 700      | 1,500    | 1,400              | 2,500    | ---  | ---  |
| Normal years                    |              | 1,000                                                                                      | 500      | 1,100    | 1,000              | 1,900    | ---  | ---  |
| Unfavorable years               |              | 700                                                                                        | 300      | 800      | 700                | 1,200    | ---  | ---  |

## 3452--Reluctan-Sumine-Colbar association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Reluctan                                                                                   | Sumine   | Colbar   | 1                  | 2        |
| Idaho fescue                    | FEID         | 20-40                                                                                      | 1-10     | ---      | X                  | ---      |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | 20-50    | 5-10     | X                  | ---      |
| Basin wildrye                   | ELCI2        | 2-15                                                                                       | 5-10     | ---      | X                  | 50-60    |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | 2-5      | 20-50    | X                  | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | 2-15     | ---      | ---                | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-5      | ---      | ---                | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | X                  | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | 15-20    |
| Tapertip hawksbeard             | CRAC2        | 1-5                                                                                        | 2-5      | 2-4      | X                  | ---      |
| Arrowleaf balsamroot            | BASA3        | 1-5                                                                                        | 2-5      | ---      | X                  | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4      | ---                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 5-10     |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | 5-15     | ---      | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20    | ---                | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5      | ---                | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5      | ---                | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | X                  | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | X                  | ---      |
| Currant                         | RIBES        | ---                                                                                        | ---      | ---      | X                  | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 10-15    |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-10     | ---                | 2-5      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---      | ---      | X                  | ---      |
| Utah juniper                    | JUOS         | ---                                                                                        | ---      | ---      | X                  | ---      |
| Range site number               |              | 024X021N                                                                                   | 024X029N | 024X005N | 025X062N           | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 1,400                                                                                      | 1,500    | 800      | 500                | 2,500    |
| Normal years                    |              | 1,000                                                                                      | 1,100    | 600      | 350                | 1,900    |
| Unfavorable years               |              | 700                                                                                        | 800      | 400      | 200                | 1,200    |

## 3453--Reluctan-Locane-Itca association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Reluctan                                                                                   | Locane   | Itca     | 1                  | 2        | 3        | 4    |
| Idaho fescue                    | FEID         | 20-40                                                                                      | ---      | 15-25    | 20-40              | ---      | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | 15-25    | 10-20    | 20-30              | 15-20    | ---      | ---  |
| Basin wildrye                   | ELCI2        | 2-15                                                                                       | ---      | ---      | 2-15               | ---      | 30-50    | ---  |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | 15-25    | ---      | 2-10               | 15-20    | ---      | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 2-10     | ---                | ---      | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | ---                | 5-8      | ---      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | ---                | 5-8      | ---      | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | ---      | ---                | 5-8      | ---      | ---  |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-20    | 2-5      | ---                | ---      | 5-15     | ---  |
| Tapertip hawksbeard             | CRAC2        | 1-5                                                                                        | 2-5      | 2-5      | 1-5                | ---      | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | 1-5                                                                                        | 2-5      | 2-5      | 1-5                | ---      | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | ---      | ---                | 1-3      | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | 1-3      | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-10     | 2-10     | ---                | ---      | 5-10     | ---  |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | 5-10     | ---      | 5-15               | ---      | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 5-10     | ---      | ---                | ---      | ---      | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---      | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | ---      | ---                | 20-30    | ---      | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     | ---  |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | 5-15     | ---                | ---      | 5-10     | ---  |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      | ---  |
| Range site number               |              | 024X021N                                                                                   | 024X035N | 025X061N | 024X021N           | 024X018N | 028B024N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 1,400                                                                                      | 500      | 500      | 1,400              | 700      | 2,800    | ---  |
| Normal years                    |              | 1,000                                                                                      | 400      | 375      | 1,000              | 500      | 1,700    | ---  |
| Unfavorable years               |              | 700                                                                                        | 250      | 250      | 700                | 300      | 1,000    | ---  |

## 3455--Reluctan-Roca-Colbar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |          |
|                                 |              | Reluctan                                                                                   | Roca     | Colbar   | 1                  | 2        | 3        | 4        |
| Idaho fescue                    | FEID         | 20-40                                                                                      | ---      | ---      | ---                | 20-40    | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | 40-60    | 5-10     | ---                | 20-30    | 2-10     | 10-20    |
| Basin wildrye                   | ELCI2        | 2-15                                                                                       | 2-5      | ---      | ---                | 2-15     | ---      | ---      |
| Thurber needlegrass             | STTH2        | 2-10                                                                                       | 5-10     | 20-50    | ---                | 2-10     | 10-20    | 5-15     |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10     | ---      | ---                | ---      | ---      | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     | 2-10     |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     | ---      |
| Tapertip hawksbeard             | CRAC2        | 1-5                                                                                        | 2-5      | 2-4      | ---                | 1-5      | ---      | 2-5      |
| Arrowleaf balsamroot            | BASA3        | 1-5                                                                                        | 2-5      | ---      | ---                | 1-5      | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4      | ---                | ---      | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-8      | 5-15     |
| Mountain big sagebrush          | ARTRV        | 5-15                                                                                       | T-5      | ---      | ---                | 5-15     | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 5-10     | 15-20    | ---                | ---      | 15-25    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5      | ---                | ---      | 2-5      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5      | ---                | ---      | 2-10     | ---      |
| Ephedra                         | EPHED        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 15-30    |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-10     | ---                | ---      | ---      | ---      |
| Range site number               |              | 024X021N                                                                                   | 024X028N | 024X005N | None               | 024X021N | 024X047N | 024X031N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |          |
| Favorable years                 |              | 1,400                                                                                      | 1,000    | 800      | ---                | 1,400    | 400      | 700      |
| Normal years                    |              | 1,000                                                                                      | 700      | 600      | ---                | 1,000    | 300      | 500      |
| Unfavorable years               |              | 700                                                                                        | 500      | 400      | ---                | 700      | 150      | 300      |

## 3560--Locane-Robson-Bregar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |          |
|                                 |              | Locane                                                                                     | Robson   | Bregar   | 1                  | 2        | 3    | 4        |
| Bluebunch wheatgrass            | AGSP         | 15-25                                                                                      | 15-20    | ---      | 5-10               | 20-30    | ---  | 10-20    |
| Thurber needlegrass             | STTH2        | 15-25                                                                                      | 15-20    | ---      | ---                | 2-10     | ---  | 5-15     |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10     | 5-10     | ---                | ---      | ---  | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 5-8      | 2-5      | ---                | ---      | ---  | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | 5-8      | 2-5      | ---                | ---      | ---  | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-8      | 2-5      | 5-10               | ---      | ---  | ---      |
| Idaho fescue                    | FEID         | ---                                                                                        | ---      | 10-20    | 30-60              | 20-40    | ---  | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10     | ---                | ---      | ---  | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | 2-15     | ---  | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 2-10     |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | ---      | ---  | 2-10     |
| Other perennial grasses         | PPGG         | 10-20                                                                                      | ---      | ---      | ---                | ---      | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | ---      | ---      | 1-3                | 1-5      | ---  | 2-5      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---      | ---                | 1-5      | ---  | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  | ---      |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---  | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | 1-3      | 2-5      | ---                | ---      | ---  | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---  | ---      |
| Other perennial forbs           | PPFF         | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---  | 5-15     |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | ---      | ---      | ---                | ---      | ---  | ---      |
| Mountain big sagebrush          | ARTRV        | 5-10                                                                                       | ---      | ---      | 5-15               | 5-15     | ---  | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 20-30    | 5-15     | ---                | ---      | ---  | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | ---      | ---  | 15-30    |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---  | ---      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---      | ---                | ---      | ---  | ---      |
| Range site number               |              | 024X035N                                                                                   | 024X018N | 024X016N | 024X023N           | 024X021N | None | 024X031N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |          |
| Favorable years                 |              | 500                                                                                        | 700      | 350      | 1,500              | 1,400    | ---  | 700      |
| Normal years                    |              | 400                                                                                        | 500      | 250      | 1,200              | 1,000    | ---  | 500      |
| Unfavorable years               |              | 250                                                                                        | 300      | 150      | 900                | 700      | ---  | 300      |

## 3561--Locane-Sumine-Glean association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |          |
|                                 |              | Locane                                                                                     | Sumine   | Glean    | 1                  | 2        | 3        | 4        |
| Bluebunch wheatgrass            | AGSP         | X                                                                                          | 20-50    | 5-10     | ---                | ---      | 40-60    | ---      |
| Basin wildrye                   | ELCI2        | X                                                                                          | 5-10     | ---      | ---                | ---      | 2-5      | 50-60    |
| Thurber needlegrass             | STTH2        | X                                                                                          | 2-5      | ---      | ---                | ---      | 5-10     | ---      |
| Nevada bluegrass                | PONE3        | X                                                                                          | ---      | ---      | ---                | ---      | ---      | 5-15     |
| Idaho fescue                    | FEID         | X                                                                                          | 1-10     | 30-60    | ---                | 10-20    | ---      | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | 2-15     | 2-5      | ---                | ---      | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-5      | ---      | ---                | 5-10     | ---      | ---      |
| Cusick bluegrass                | POCU3        | ---                                                                                        | ---      | 5-10     | ---                | 2-5      | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      | 1-5      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 15-20    |
| Tapertip hawksbeard             | CRAC2        | X                                                                                          | 2-5      | 1-3      | ---                | ---      | 2-5      | ---      |
| Arrowleaf balsamroot            | BASA3        | X                                                                                          | 2-5      | ---      | ---                | ---      | 2-5      | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | 1-2      | ---                | ---      | ---      | ---      |
| Goldenweed                      | HAPLO2       | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 5-10     |
| Big sagebrush                   | ARTR2        | X                                                                                          | ---      | ---      | ---                | ---      | ---      | ---      |
| Snowberry                       | SYMPH        | X                                                                                          | ---      | 2-5      | ---                | ---      | ---      | ---      |
| Currant                         | RIBES        | X                                                                                          | ---      | ---      | ---                | ---      | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-15     | 5-15     | ---                | ---      | T-5      | ---      |
| Low sagebrush                   | ARAR8        | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | ---      | 10-15    |
| Singleleaf pinyon               | PIMO         | X                                                                                          | ---      | ---      | ---                | ---      | ---      | ---      |
| Utah juniper                    | JUOS         | X                                                                                          | ---      | ---      | ---                | ---      | ---      | ---      |
| Range site number               |              | 025X062N                                                                                   | 024X029N | 024X023N | None               | 024X016N | 024X028N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |          |
| Favorable years                 |              | 500                                                                                        | 1,500    | 1,500    | ---                | 350      | 1,000    | 2,500    |
| Normal years                    |              | 350                                                                                        | 1,100    | 1,200    | ---                | 250      | 700      | 1,900    |
| Unfavorable years               |              | 200                                                                                        | 800      | 900      | ---                | 150      | 500      | 1,200    |



## 3564--Locane-Zoesta-Bucan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Locane                                                                                     | Zoesta   | Bucan    | 1                  | 2        | 3        | 4    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 15-20    | 5-10     | 10-15              | 15-25    | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 15-20    | 40-60    | ---                | 20-30    | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10     | ---      | ---                | ---      | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 5-8      | ---      | ---                | ---      | ---      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | 5-8      | ---      | ---                | ---      | ---      | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-8      | ---      | ---                | ---      | ---      | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 2-10     | 2-10               | ---      | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 2-5      | ---                | ---      | 50-60    | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | ---      | 10-15              | ---      | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | 2-10     | 5-15     | ---  |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | 5-20               | 10-15    | 15-20    | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-5      | ---      | ---                | ---      | ---      | ---  |
| Tapertip hawkbeard              | CRAC2        | 2-4                                                                                        | ---      | 2-5      | ---                | 2-5      | ---      | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | 2-5      | ---                | 2-5      | ---      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 2-5      | 5-10     | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | ---      | 5-10     | ---                | ---      | ---      | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---      | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 20-30    | ---      | ---                | ---      | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | T-5      | ---                | ---      | ---      | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---      | 25-35              | ---      | ---      | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | ---      | ---                | 10-15    | ---      | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---      | 5-35               | 5-10     | 2-5      | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X018N | 024X028N | 024X030N           | 025X014N | 025X003N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 800                                                                                        | 700      | 1,000    | 500                | 1,000    | 2,500    | ---  |
| Normal years                    |              | 600                                                                                        | 500      | 700      | 350                | 800      | 1,900    | ---  |
| Unfavorable years               |              | 400                                                                                        | 300      | 500      | 250                | 600      | 1,200    | ---  |

## 3621--Minat-Bojo-Stingdorn association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |           |                    |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|-----------|--------------------|------|
|                                 |              | Soil name                                                                                  |          |           | Inclusion number-- |      |
|                                 |              | Minat                                                                                      | Bojo     | Stingdorn | 1                  | 2    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 2-5      | ---       | ---                | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | ---      | ---       | ---                | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 2-10     | 5-15      | ---                | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | 2-10     | 5-15      | ---                | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | 2-10     | ---       | ---                | ---  |
| Desert needlegrass              | STSP3        | ---                                                                                        | 2-5      | ---       | ---                | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | 2-5       | ---                | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | 2-5      | ---       | ---                | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3       | ---                | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-2      | ---       | ---                | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---      | ---       | ---                | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | ---      | ---       | ---                | ---  |
| Hawksbeard                      | CREPI        | ---                                                                                        | 1-2      | ---       | ---                | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8       | ---                | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 10-25    | ---       | ---                | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---       | ---                | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 5-15     | 2-5       | ---                | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | 10-25    | 30-40     | ---                | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 2-5      | 20-30     | ---                | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5       | ---                | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | ---      | ---       | ---                | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X026N | 024X002N  | None               | None |
| Potential production (lb/acre): |              |                                                                                            |          |           |                    |      |
| Favorable years                 |              | 800                                                                                        | 400      | 700       | ---                | ---  |
| Normal years                    |              | 600                                                                                        | 300      | 450       | ---                | ---  |
| Unfavorable years               |              | 400                                                                                        | 200      | 300       | ---                | ---  |

## 3622--Minat-Minat, eroded, association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |               |                    |      |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|---------------|--------------------|------|----------|------|
|                                 |              | Soil name                                                                                  |               | Inclusion number-- |      |          |      |
|                                 |              | Minat                                                                                      | Minat, eroded | 1                  | 2    | 3        | 4    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 15-25         | 20-50              | ---  | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 15-25         | 5-10               | ---  | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---           | ---                | ---  | 50-60    | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---           | ---                | ---  | 5-15     | ---  |
| Mat muhly                       | MURI         | ---                                                                                        | ---           | ---                | ---  | 2-10     | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---           | ---                | ---  | 1-5      | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-20         | ---                | ---  | 15-20    | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | ---           | 2-4                | ---  | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-5           | 2-4                | ---  | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5           | ---                | ---  | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-10          | ---                | ---  | 5-10     | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 5-10          | 15-20              | ---  | ---      | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | ---           | 2-5                | ---  | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | ---           | 2-5                | ---  | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-10          | ---                | ---  | ---      | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---           | ---                | ---  | 10-15    | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10          | 2-10               | ---  | 2-5      | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X035N      | 024X005N           | None | 025X003N | None |
| Potential production (lb/acre): |              |                                                                                            |               |                    |      |          |      |
| Favorable years                 |              | 800                                                                                        | 500           | 800                | ---  | 2,500    | ---  |
| Normal years                    |              | 600                                                                                        | 400           | 600                | ---  | 1,900    | ---  |
| Unfavorable years               |              | 400                                                                                        | 250           | 400                | ---  | 1,200    | ---  |

## 3624--Minat-Colbar-Atlow association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |      |
|                                 |              | Minat                                                                                      | Colbar   | Atlow    | 1                  | 2        | 3    | 4    |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | 10-15    | 20-50              | ---      | ---  | ---  |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---      | 5-10               | ---      | ---  | ---  |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 10-15    | ---                | ---      | ---  | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 2-10     | ---                | ---      | ---  | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | 50-60    | ---  | ---  |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---  | ---  |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 5-20     | ---                | ---      | ---  | ---  |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---      | 2-4                | ---      | ---  | ---  |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---      | 2-4                | ---      | ---  | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 2-8      | ---  | ---  |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---      | 15-20              | ---      | ---  | ---  |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---      | 2-5                | ---      | ---  | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---      | 2-5                | ---      | ---  | ---  |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 25-35    | ---                | ---      | ---  | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 15-20    | ---  | ---  |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---  | ---  |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---  | ---  |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | 5-35     | 2-10               | ---      | ---  | ---  |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 024X030N | 024X005N           | 024X006N | None | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |      |
| Favorable years                 |              | 800                                                                                        | 800      | 500      | 800                | 1,500    | ---  | ---  |
| Normal years                    |              | 600                                                                                        | 600      | 350      | 600                | 1,100    | ---  | ---  |
| Unfavorable years               |              | 400                                                                                        | 400      | 250      | 400                | 600      | ---  | ---  |

## 3650--McVegas-Old Camp-Kingingham association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |            |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|------------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |            | Inclusion number-- |          |      |
|                                 |              | McVegas                                                                                    | Old Camp | Kingingham | 1                  | 2        | 3    |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | ---      | 5-15       | 2-10               | 2-10     | ---  |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | 5-15       | 2-10               | 5-15     | ---  |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | 2-5        | 2-5                | 2-10     | ---  |
| Needleandthread                 | STCO4        | 1-3                                                                                        | ---      | 1-3        | ---                | ---      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 20-50    | ---        | 2-5                | 10-20    | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-10     | ---        | ---                | ---      | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---        | 2-10               | ---      | ---  |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | ---        | 2-5                | ---      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---        | 2-5                | ---      | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | ---        | 1-2                | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---        | ---                | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-4      | ---        | ---                | 1-2      | ---  |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---      | ---        | 1-2                | ---      | ---  |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---        | ---                | 1-2      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---        | ---                | 1-2      | ---  |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | ---      | 2-8        | ---                | ---      | ---  |
| Shadscale                       | ATCO         | 30-40                                                                                      | ---      | 30-40      | 10-25              | ---      | ---  |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | ---      | 20-30      | 2-5                | ---      | ---  |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5        | 5-15               | 5-15     | ---  |
| Winterfat                       | EULA5        | 2-5                                                                                        | ---      | 2-5        | ---                | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | ---        | 10-25              | 30-35    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | ---        | 2-5                | ---      | ---  |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-10     | ---        | ---                | ---      | ---  |
| Range site number               |              | 024X002N                                                                                   | 024X005N | 024X002N   | 024X026N           | 024X020N | None |
| Potential production (lb/acre): |              |                                                                                            |          |            |                    |          |      |
| Favorable years                 |              | 700                                                                                        | 800      | 700        | 400                | 700      | ---  |
| Normal years                    |              | 450                                                                                        | 600      | 450        | 300                | 450      | ---  |
| Unfavorable years               |              | 300                                                                                        | 400      | 300        | 200                | 300      | ---  |

## 3651--McVegas-Boeska association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | McVegas                                                                                    | Beoska   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 2-10               | ---      | 5-10     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | ---      | 10-30    |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-10               | ---      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | ---                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 10-20              | 20-50    | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | ---                | 5-10     | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---                | ---      | 10-20    |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 1-2                | 2-4      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 1-2                | ---      | ---      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | 1-2                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---                | 2-4      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8      | ---                | ---      | 5-15     |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | ---                | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 5-15               | 2-5      | 1-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 30-35              | 15-20    | 10-25    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---                | 2-5      | 1-5      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | ---                | ---      | 1-5      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | ---                | ---      | 5-15     |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | ---                | ---      | T-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---                | 2-10     | 2-4      |
| Range site number               |              | 024X002N                                                                                   | 024X002N | 024X020N           | 024X005N | 025X025N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 800      | 200      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 600      | 150      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 400      | 100      |

## 3652--McVegas-Stingdorn-Colbar association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |           |          | Inclusion number-- |          |          |
|                                 |              | McVegas                                                                                    | Stingdorn | Colbar   | 1                  | 2        | 3        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15      | ---      | ---                | ---      | 2-5      |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15      | ---      | ---                | ---      | 2-5      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5       | ---      | ---                | ---      | ---      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3       | ---      | ---                | ---      | 2-5      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---       | 20-50    | ---                | 20-50    | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---       | 5-10     | ---                | 5-10     | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---       | ---      | ---                | ---      | 10-20    |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---       | ---      | ---                | ---      | 5-10     |
| Balsamroot                      | BALSA        | ---                                                                                        | ---       | 2-4      | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---       | 2-4      | ---                | 2-4      | ---      |
| Other perennial forbs           | PPFF         | 2-8                                                                                        | 2-8       | ---      | ---                | ---      | 5-10     |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40     | ---      | ---                | ---      | ---      |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30     | ---      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5       | 2-5      | ---                | 2-5      | ---      |
| Winterfat                       | EULAS        | 2-5                                                                                        | 2-5       | ---      | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---       | 15-20    | ---                | 15-20    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---       | 2-5      | ---                | 2-5      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---       | ---      | ---                | ---      | 10-15    |
| Greene rabbitbrush              | CHGR6        | ---                                                                                        | ---       | ---      | ---                | ---      | 2-5      |
| Nevada ephedra                  | EPNE         | ---                                                                                        | ---       | ---      | ---                | ---      | 2-5      |
| Fourwing saltbush               | ATCA2        | ---                                                                                        | ---       | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---       | 2-10     | ---                | 2-10     | 2-10     |
| Range site number               |              | 024X002N                                                                                   | 024X002N  | 024X005N | None               | 025X005N | 028B009N |
| Potential production (lb/acre): |              |                                                                                            |           |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700       | 800      | ---                | 800      | 700      |
| Normal years                    |              | 450                                                                                        | 450       | 600      | ---                | 600      | 400      |
| Unfavorable years               |              | 300                                                                                        | 300       | 400      | ---                | 400      | 300      |

## 3661--Dun Glen-Whirlo association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |
|                                 |              | Dun Glen                                                                                   | Whirlo   | 1                  | 2        |
| Bottlebrush squirreltail        | SIHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 5-15               | 5-15     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Needleandthread                 | STCO4        | 1-3                                                                                        | 1-3      | 1-3                | 1-3      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 2-8      | 2-8                | 2-8      |
| Shadscale                       | ATCO         | 30-40                                                                                      | 30-40    | 30-40              | 30-40    |
| Bud sagebrush                   | ARSP5        | 20-30                                                                                      | 20-30    | 20-30              | 20-30    |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Winterfat                       | EULA5        | 2-5                                                                                        | 2-5      | 2-5                | 2-5      |
| Range site number               |              | O24X002N                                                                                   | O24X002N | O24X002N           | O24X002N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |
| Favorable years                 |              | 700                                                                                        | 700      | 700                | 700      |
| Normal years                    |              | 450                                                                                        | 450      | 450                | 450      |
| Unfavorable years               |              | 300                                                                                        | 300      | 300                | 300      |



## 3690--Izod-Koynik-Rock outcrop association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |              |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |              | Inclusion number-- |          |          |
|                                 |              | Izod                                                                                       | Koynik   | Rock outcrop | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 5-15     | ---          | 10-15              | ---      | 5-15     |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | ---      | ---          | 10-15              | 20-50    | 10-20    |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---          | 2-10               | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15     | ---          | ---                | ---      | 2-10     |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5      | ---          | ---                | ---      | 2-10     |
| Needleandthread                 | STC04        | ---                                                                                        | 1-3      | ---          | ---                | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | ---          | ---                | 5-10     | ---      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---          | 5-20               | ---      | ---      |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---          | 2-5                | ---      | 1-2      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---          | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---          | ---                | 2-4      | 1-2      |
| Phlox                           | PHLOX        | ---                                                                                        | ---      | ---          | ---                | ---      | 1-2      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8      | ---          | ---                | ---      | ---      |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---          | 25-35              | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | ---          | ---                | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | ---          | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | ---          | ---                | 2-5      | 5-15     |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---          | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---          | ---                | 15-20    | 30-35    |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---          | ---                | 2-5      | ---      |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | ---          | 5-35               | 2-10     | ---      |
| Range site number               |              | 024X030N                                                                                   | 024X002N | None         | 024X030N           | 024X005N | 024X020N |
| Potential production (lb/acre): |              |                                                                                            |          |              |                    |          |          |
| Favorable years                 |              | 500                                                                                        | 700      | ---          | 500                | 800      | 700      |
| Normal years                    |              | 350                                                                                        | 450      | ---          | 350                | 600      | 450      |
| Unfavorable years               |              | 250                                                                                        | 300      | ---          | 250                | 400      | 300      |

## 3691--Izod-Rock outcrop association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |              |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |              | Inclusion number-- |          |          |
|                                 |              | Izod                                                                                       | Rock outcrop | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---          | X                  | ---      | ---      |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | ---          | X                  | 20-50    | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---          | X                  | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---          | X                  | 5-10     | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---          | ---                | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---          | ---                | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---          | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---          | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---          | X                  | ---      | 15-20    |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---          | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---          | X                  | 2-4      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---          | X                  | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---          | ---                | 2-4      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---          | X                  | ---      | 5-10     |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---          | X                  | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---          | X                  | 2-5      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---          | ---                | 15-20    | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---          | ---                | 2-5      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---          | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---          | X                  | 2-10     | 2-5      |
| Utah juniper                    | JUOS         | ---                                                                                        | ---          | X                  | ---      | ---      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---          | X                  | ---      | ---      |
| Range site number               |              | 024X030N                                                                                   | None         | 025X063N           | 024X005N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |              |                    |          |          |
| Favorable years                 |              | 500                                                                                        | ---          | 400                | 800      | 2,500    |
| Normal years                    |              | 350                                                                                        | ---          | 250                | 600      | 1,900    |
| Unfavorable years               |              | 250                                                                                        | ---          | 150                | 400      | 1,200    |

## 3693--Izod-Attella-Xine association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Izod                                                                                       | Attella  | Xine     | 1                  | 2        | 3        | 4    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | ---      | ---                | 10-15    | ---      | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | X        | 2-10     | 2-10               | 10-15    | ---      | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | ---      | ---                | 2-10     | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | X        | 20-30    | 20-30              | ---      | ---      | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | X        | 2-15     | 2-15               | ---      | 50-60    | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | X        | ---      | ---                | ---      | 5-15     | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | X        | 20-40    | 20-40              | ---      | ---      | ---  |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     | ---  |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---      | ---                | 5-20     | 15-20    | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---      | ---                | 2-5      | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | X        | 1-5      | 1-5                | ---      | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | X        | 1-5      | 1-5                | ---      | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | ---      | ---                | 25-35    | ---      | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | X        | ---      | ---                | ---      | ---      | ---  |
| Snowberry                       | SYMPH        | ---                                                                                        | X        | ---      | ---                | ---      | ---      | ---  |
| Currant                         | RIBES        | ---                                                                                        | X        | ---      | ---                | ---      | ---      | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | 5-15     | 5-15               | ---      | ---      | ---  |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | ---      | ---                | 5-35     | 2-5      | ---  |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | X        | ---      | ---                | ---      | ---      | ---  |
| Utah juniper                    | JUOS         | ---                                                                                        | X        | ---      | ---                | ---      | ---      | ---  |
| Range site number               |              | 024X030N                                                                                   | 025X062N | 024X021N | 024X021N           | 024X030N | 025X003N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 500                                                                                        | 500      | 1,400    | 1,400              | 500      | 2,500    | ---  |
| Normal years                    |              | 350                                                                                        | 350      | 1,000    | 1,000              | 350      | 1,900    | ---  |
| Unfavorable years               |              | 250                                                                                        | 200      | 700      | 700                | 250      | 1,200    | ---  |

3740--Kelk silt loam, saline, 0 to 4 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Kelk                                                                                       | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 5-20                                                                                       | 20-40              | ---      | 50-60    |
| Bottlebrush squirreltail        | SIHY         | 2-5                                                                                        | ---                | 5-15     | ---      |
| Indian ricegrass                | ORHY         | 2-5                                                                                        | ---                | 5-15     | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---                | 2-5      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---                | 1-3      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---                | ---      | 5-15     |
| Thelypody                       | THELY        | 2-4                                                                                        | ---                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8                | 2-8      | 2-8      |
| Black greasewood                | SAVE4        | 20-30                                                                                      | 5-15               | ---      | 2-10     |
| Basin big sagebrush             | ARTRT*       | 5-15                                                                                       | 2-10               | ---      | 15-20    |
| Wyoming big sagebrush           | ARTRW*       | 5-10                                                                                       | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | ---                | 2-5      | ---      |
| Torrey quailbush                | ATTO         | ---                                                                                        | 30-50              | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---                | 30-40    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---                | 20-30    | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---                | 2-5      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---                | ---      | 2-5      |
| Range site number               |              | 024X022N                                                                                   | 024X015N           | 024X002N | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 1,500              | 700      | 1,500    |
| Normal years                    |              | 600                                                                                        | 1,200              | 450      | 1,100    |
| Unfavorable years               |              | 350                                                                                        | 800                | 300      | 600      |

## 3741--Kelk-Settlemeier association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |             |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |             | Inclusion number-- |          |          |
|                                 |              | Kelk                                                                                       | Settlemeier | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | 50-60       | 20-40              | ---      | 10-20    |
| Western wheatgrass              | AGSM         | 5-15                                                                                       | ---         | ---                | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | 5-15        | ---                | ---      | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | 2-10        | ---                | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | 1-5         | ---                | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---         | ---                | 5-10     | 2-5      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---         | ---                | ---      | 5-10     |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---         | ---                | ---      | 2-5      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---         | ---                | ---      | 2-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 15-20       | ---                | T-10     | ---      |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | 5-10        | 2-8                | 2-8      | 2-5      |
| Basin big sagebrush             | ARTRT*       | 15-20                                                                                      | 10-15       | 2-10               | ---      | 10-20    |
| Black greasewood                | SAVE4        | 2-10                                                                                       | ---         | 5-15               | 15-30    | ---      |
| Rubber rabbitbrush              | CHNA2        | 2-5                                                                                        | ---         | ---                | ---      | ---      |
| Torrey quailbush                | ATTO         | ---                                                                                        | ---         | 30-50              | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---         | ---                | 30-50    | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---         | ---                | 5-15     | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---         | ---                | 2-15     | ---      |
| Woods rose                      | ROWO         | ---                                                                                        | ---         | ---                | ---      | 2-5      |
| Common chokecherry              | PRVI         | ---                                                                                        | ---         | ---                | ---      | 2-5      |
| Green ephedra                   | EPVI         | ---                                                                                        | ---         | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | ---                                                                                        | 2-5         | ---                | ---      | 5-10     |
| Range site number               |              | 024X006N                                                                                   | 025X003N    | 024X015N           | 024X003N | 028B006N |
| Potential production (lb/acre): |              |                                                                                            |             |                    |          |          |
| Favorable years                 |              | 1,500                                                                                      | 2,500       | 1,500              | 600      | 1,000    |
| Normal years                    |              | 1,100                                                                                      | 1,900       | 1,200              | 450      | 600      |
| Unfavorable years               |              | 600                                                                                        | 1,200       | 800                | 300      | 400      |

## 3742--Kelk-Ocala association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Kelk                                                                                       | Ocala    | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | 40-60    | ---                | 5-15     | 50-60    |
| Western wheatgrass              | AGSM         | 5-15                                                                                       | ---      | ---                | ---      | ---      |
| Alkali sacaton                  | SPAI         | ---                                                                                        | 15-30    | ---                | ---      | ---      |
| Inland saltgrass                | DIST         | ---                                                                                        | 5-10     | ---                | 5-10     | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10               | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---                | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | T-10               | ---      | 15-20    |
| Perennial forbs                 | PPFF         | 2-8                                                                                        | ---      | 2-8                | T-5      | 5-10     |
| Basin big sagebrush             | ARTRT*       | 15-20                                                                                      | ---      | ---                | ---      | 10-15    |
| Black greasewood                | SAVE4        | 2-10                                                                                       | 5-15     | 15-30              | 60-75    | ---      |
| Rubber rabbitbrush              | CHNA2        | 2-5                                                                                        | 1-2      | ---                | ---      | ---      |
| Alkali rabbitbrush              | CHAL9        | ---                                                                                        | 1-2      | ---                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-50              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 5-15               | ---      | ---      |
| Seepweed                        | SUAED        | ---                                                                                        | ---      | 2-15               | ---      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | ---                | ---      | 2-5      |
| Range site number               |              | 024X006N                                                                                   | 024X007N | 024X003N           | 024X011N | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 1,500                                                                                      | 1,900    | 600                | 500      | 2,500    |
| Normal years                    |              | 1,100                                                                                      | 1,400    | 450                | 350      | 1,900    |
| Unfavorable years               |              | 600                                                                                        | 800      | 300                | 200      | 1,200    |

## 3840--Jung-Norfork-Buffaran association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |
|                                 |              | Jung                                                                                       | Norfork  | Buffaran | 1                  | 2        | 3    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 10-15    | ---      | 10-15              | ---      | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 10-15    | 20-50    | 10-15              | 20-50    | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10     | ---      | 2-10               | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | 5-10     | ---                | 5-10     | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | 5-20     | ---      | 5-20               | ---      | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | 2-5      | ---      | 2-5                | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4      | ---                | 2-4      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | 2-4      | ---                | 2-4      | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | 25-35    | ---      | 25-35              | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20    | ---                | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5      | ---                | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5      | ---                | 2-5      | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 5-35     | 2-10     | 5-35               | 2-10     | ---  |
| Range site number               |              | 024X030N                                                                                   | 024X030N | 024X005N | 024X030N           | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |
| Favorable years                 |              | 500                                                                                        | 500      | 800      | 500                | 800      | ---  |
| Normal years                    |              | 350                                                                                        | 350      | 600      | 350                | 600      | ---  |
| Unfavorable years               |              | 250                                                                                        | 250      | 400      | 250                | 400      | ---  |

## 3841--Jung-Itca-Roca association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |      |
|                                 |              | Jung                                                                                       | Itca     | Roca     | 1                  | 2        | 3    |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | ---      | ---      | ---                | ---      | ---  |
| Needleandthread                 | STCO4        | 5-15                                                                                       | ---      | ---      | ---                | ---      | ---  |
| Pine bluegrass                  | POSC         | 2-5                                                                                        | ---      | ---      | ---                | 20-30    | ---  |
| Bluebunch wheatgrass            | AGSP         | 1-3                                                                                        | 10-20    | 40-60    | 20-30              | ---      | ---  |
| Idaho fescue                    | FEID         | ---                                                                                        | 15-25    | ---      | ---                | ---      | ---  |
| Bluegrass                       | POA++        | ---                                                                                        | 2-10     | 2-10     | ---                | ---      | ---  |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | 5-10     | 15-25              | 5-10     | ---  |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---  |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | 2-10               | ---      | ---  |
| Other perennial grasses         | PPGG         | 5-10                                                                                       | 2-5      | ---      | 10-15              | 5-15     | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | 2-5      | 2-5                | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | 2-5      | 2-5      | 2-5                | ---      | ---  |
| Other perennial forbs           | PPFF         | 5-15                                                                                       | 2-10     | ---      | 2-5                | 5-10     | ---  |
| Black sagebrush                 | ARARN        | 20-25                                                                                      | ---      | ---      | ---                | ---      | ---  |
| Fourwing saltbush               | ATCA2        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Bud sagebrush                   | ARSP5        | 2-5                                                                                        | ---      | ---      | ---                | ---      | ---  |
| Big sagebrush                   | ARTR2        | ---                                                                                        | 5-10     | ---      | 10-15              | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 5-10     | ---                | 10-20    | ---  |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | T-5      | ---                | ---      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---  |
| Nevada ephedra                  | EPNE         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---  |
| Other shrubs                    | SSSS         | 10-20                                                                                      | 5-15     | ---      | 5-10               | 5-10     | ---  |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---  |
| Range site number               |              | 028B016N                                                                                   | 025X061N | 024X028N | 025X014N           | 027X007N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |      |
| Favorable years                 |              | 500                                                                                        | 500      | 1,000    | 1,000              | 600      | ---  |
| Normal years                    |              | 250                                                                                        | 375      | 700      | 800                | 450      | ---  |
| Unfavorable years               |              | 150                                                                                        | 250      | 500      | 600                | 300      | ---  |



## 3843--Jung, steep-Robson-Jung association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Jung, steep                                                                                | Robson   | Jung     | 1                  | 2        | 3        | 4    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | ---      | 10-15    | ---                | 5-15     | ---      | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 15-20    | 10-15    | 20-50              | ---      | 20-50    | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---      | 2-10     | ---                | ---      | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 15-20    | ---      | 5-10               | ---      | 5-10     | ---  |
| Webber ricegrass                | ORWE         | ---                                                                                        | 5-10     | ---      | ---                | ---      | ---      | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 5-8      | ---      | ---                | 2-5      | ---      | ---  |
| Pine bluegrass                  | POSC         | ---                                                                                        | 5-8      | ---      | ---                | ---      | ---      | ---  |
| Cusick bluegrass                | POCU3        | ---                                                                                        | 5-8      | ---      | ---                | ---      | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | 5-15     | ---      | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | ---      | ---                | 1-3      | ---      | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | 5-20     | ---                | ---      | ---      | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | 2-5      | ---                | ---      | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-5      | ---      | 2-4                | ---      | 2-4      | ---  |
| Eriogonum                       | ERIOG        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---      | ---  |
| Phlox                           | PHLOX        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | 2-4                | ---      | 2-4      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | ---                | 2-8      | ---      | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---      | 25-35    | ---                | ---      | ---      | ---  |
| Low sagebrush                   | ARAR8        | ---                                                                                        | 20-30    | ---      | ---                | ---      | ---      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | 15-20              | ---      | 15-20    | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---      | 2-5                | ---      | 2-5      | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | 2-5                | ---      | 2-5      | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | 30-40    | ---      | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | ---      | ---                | 20-30    | ---      | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | 5-35     | 2-10               | ---      | 2-10     | ---  |
| Range site number               |              | 024X030N                                                                                   | 024X018N | 024X030N | 024X005N           | 024X002N | 024X005N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 500                                                                                        | 700      | 500      | 800                | 700      | 800      | ---  |
| Normal years                    |              | 350                                                                                        | 500      | 350      | 600                | 450      | 600      | ---  |
| Unfavorable years               |              | 250                                                                                        | 300      | 250      | 400                | 300      | 400      | ---  |

## 3845--Jung-Stingdorn-Atlow association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |           |          |                    |          |      |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-----------|----------|--------------------|----------|------|------|
|                                 |              | Soil name                                                                                  |           |          | Inclusion number-- |          |      |      |
|                                 |              | Jung                                                                                       | Stingdorn | Atlow    | 1                  | 2        | 3    | 4    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 5-15      | 10-15    | 5-15               | 5-15     | ---  | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | ---       | 10-15    | ---                | ---      | ---  | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | ---       | 2-10     | ---                | ---      | ---  | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | 5-15      | ---      | 5-15               | 5-15     | ---  | ---  |
| Sandberg bluegrass              | POSE         | ---                                                                                        | 2-5       | ---      | 2-5                | 2-5      | ---  | ---  |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3       | ---      | 1-3                | 1-3      | ---  | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---       | 5-20     | ---                | ---      | ---  | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---       | 2-5      | ---                | ---      | ---  | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | 2-8       | ---      | 2-8                | 2-8      | ---  | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | ---       | 25-35    | ---                | ---      | ---  | ---  |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40     | ---      | 30-40              | 30-40    | ---  | ---  |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30     | ---      | 20-30              | 20-30    | ---  | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5       | ---      | 2-5                | 2-5      | ---  | ---  |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5       | ---      | 2-5                | 2-5      | ---  | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---       | 5-35     | ---                | ---      | ---  | ---  |
| Range site number               |              | 024X030N                                                                                   | 024X002N  | 024X030N | 024X002N           | 024X002N | None | None |
| Potential production (lb/acre): |              |                                                                                            |           |          |                    |          |      |      |
| Favorable years                 |              | 500                                                                                        | 700       | 500      | 700                | 700      | ---  | ---  |
| Normal years                    |              | 350                                                                                        | 450       | 350      | 450                | 450      | ---  | ---  |
| Unfavorable years               |              | 250                                                                                        | 300       | 250      | 300                | 300      | ---  | ---  |

## 3846--Jung-Wiskan association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |      |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |      |          |
|                                 |              | Jung                                                                                       | Wiskan   | 1                  | 2        | 3    | 4        |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 2-10     | ---                | ---      | ---  | ---      |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 5-15     | 20-50              | 15-25    | ---  | ---      |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10     | ---                | ---      | ---  | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 10-20    | 5-10               | 15-25    | ---  | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---                | ---      | ---  | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---                | ---      | ---  | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---                | ---      | ---  | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---                | ---      | ---  | 1-5      |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | ---      | ---                | 10-20    | ---  | 15-20    |
| Globemallow                     | SPHAE        | 2-5                                                                                        | ---      | ---                | ---      | ---  | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | 2-5      | 2-4                | 2-5      | ---  | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | 2-4                | ---      | ---  | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---                | 2-5      | ---  | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 5-15     | ---                | 2-10     | ---  | 5-10     |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | 15-30    | ---                | ---      | ---  | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | 15-20              | 5-10     | ---  | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 2-5                | ---      | ---  | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 2-5                | ---      | ---  | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | ---                | 5-10     | ---  | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---                | ---      | ---  | 10-15    |
| Other shrubs                    | SSSS         | 5-35                                                                                       | ---      | 2-10               | 2-10     | ---  | 2-5      |
| Range site number               |              | 024X030N                                                                                   | 024X031N | 024X005N           | 024X035N | None | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |      |          |
| Favorable years                 |              | 500                                                                                        | 700      | 800                | 500      | ---  | 2,500    |
| Normal years                    |              | 350                                                                                        | 500      | 600                | 400      | ---  | 1,900    |
| Unfavorable years               |              | 250                                                                                        | 300      | 400                | 250      | ---  | 1,200    |

## 3881--Layview-Packer-Hapgood association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |      |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |      |          |          |
|                                 |              | Layview                                                                                    | Packer   | Hapgood  | 1                  | 2    | 3        | 4        |
| Idaho fescue                    | FEID         | 10-20                                                                                      | ---      | 5-15     | ---                | ---  | 10-20    | 30-60    |
| Webber ricegrass                | ORWE         | 5-10                                                                                       | ---      | ---      | ---                | ---  | 5-10     | ---      |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 2-5      | ---      | ---                | ---  | 5-10     | ---      |
| Cusick bluegrass                | POCU3        | 2-5                                                                                        | ---      | ---      | ---                | ---  | 2-5      | 5-10     |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---      |
| Pine bluegrass                  | POSC         | 2-5                                                                                        | 5-10     | ---      | ---                | ---  | 2-5      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | 5-15     | 5-10     | ---                | ---  | ---      | 2-10     |
| Thurber needlegrass             | STTH2        | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | 2-5      | ---      | ---                | ---  | ---      | ---      |
| Mountain brome                  | BRMA4        | ---                                                                                        | ---      | 10-15    | ---                | ---  | ---      | ---      |
| Slender wheatgrass              | AGTR         | ---                                                                                        | ---      | 10-15    | ---                | ---  | ---      | ---      |
| Bearded wheatgrass              | AGSU         | ---                                                                                        | ---      | 10-15    | ---                | ---  | ---      | ---      |
| Spike fescue                    | HEKI         | ---                                                                                        | ---      | 2-15     | ---                | ---  | ---      | ---      |
| Bulbous oniongrass              | MEBU         | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---      |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---      |
| Other perennial grasses         | PPGG         | ---                                                                                        | 10-15    | ---      | ---                | ---  | ---      | ---      |
| Goldenweed                      | HAPLO2       | 2-5                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---      |
| Phlox                           | PHLOX        | 2-5                                                                                        | ---      | ---      | ---                | ---  | 2-5      | ---      |
| Geranium                        | GERAN        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---      |
| Groundsel                       | SENEC        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---      |
| Lupine                          | LUPIN        | ---                                                                                        | ---      | 2-5      | ---                | ---  | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | ---                | ---  | ---      | 2-5      |
| Other perennial forbs           | PPFF         | ---                                                                                        | 10-15    | ---      | ---                | ---  | ---      | ---      |
| Low sagebrush                   | ARAR8        | 5-15                                                                                       | 25-30    | ---      | ---                | ---  | 5-15     | ---      |
| Black sagebrush                 | ARARN        | 5-15                                                                                       | ---      | ---      | ---                | ---  | 5-15     | 10-20    |
| Serviceberry                    | AMELA        | ---                                                                                        | ---      | 5-10     | ---                | ---  | ---      | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | ---      | 5-10     | ---                | ---  | ---      | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | ---      | 2-10     | ---                | ---  | ---      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | 10-20    | ---      | ---                | ---  | ---      | ---      |
| Range site number               |              | 024X016N                                                                                   | 028B037N | 024X032N | None               | None | 024X016N | 024X042N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |      |          |          |
| Favorable years                 |              | 350                                                                                        | 700      | 2,200    | ---                | ---  | 350      | 1,000    |
| Normal years                    |              | 250                                                                                        | 500      | 1,700    | ---                | ---  | 250      | 800      |
| Unfavorable years               |              | 150                                                                                        | 300      | 1,200    | ---                | ---  | 150      | 500      |

## 3950--Hooplite-Jung-Izod association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |      |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |      |
|                                 |              | Hooplite                                                                                   | Jung     | Izod     | 1                  | 2        | 3        | 4    |
| Indian ricegrass                | ORHY         | 10-15                                                                                      | 10-15    | 10-15    | X                  | ---      | 10-30    | ---  |
| Thurber needlegrass             | STTH2        | 10-15                                                                                      | 10-15    | 10-15    | X                  | 20-50    | ---      | ---  |
| Bluegrass                       | POA++        | 2-10                                                                                       | 2-10     | 2-10     | X                  | ---      | ---      | ---  |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | ---      | X                  | 5-10     | ---      | ---  |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-10     | ---  |
| Other perennial grasses         | PPGG         | 5-20                                                                                       | 5-20     | 5-20     | X                  | ---      | 10-20    | ---  |
| Globemallow                     | SPHAE        | 2-5                                                                                        | 2-5      | 2-5      | ---                | ---      | ---      | ---  |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---      | ---      | X                  | 2-4      | ---      | ---  |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | ---      | X                  | ---      | ---      | ---  |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---      | ---                | 2-4      | ---      | ---  |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | X                  | ---      | 5-15     | ---  |
| Black sagebrush                 | ARARN        | 25-35                                                                                      | 25-35    | 25-35    | X                  | ---      | 5-15     | ---  |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | ---      | X                  | 2-5      | 1-5      | ---  |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---      | ---                | 15-20    | 10-25    | ---  |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---      | ---                | 2-5      | 1-5      | ---  |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      | ---  |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | ---      | ---                | ---      | T-5      | ---  |
| Other shrubs                    | SSSS         | 5-35                                                                                       | 5-35     | 5-35     | X                  | 2-10     | 2-4      | ---  |
| Utah juniper                    | JUOS         | ---                                                                                        | ---      | ---      | X                  | ---      | ---      | ---  |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | ---      | ---      | X                  | ---      | ---      | ---  |
| Range site number               |              | 024X030N                                                                                   | 024X030N | 024X030N | 025X063N           | 024X005N | 025X025N | None |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |      |
| Favorable years                 |              | 500                                                                                        | 500      | 500      | 400                | 800      | 200      | ---  |
| Normal years                    |              | 350                                                                                        | 350      | 350      | 250                | 600      | 150      | ---  |
| Unfavorable years               |              | 250                                                                                        | 250      | 250      | 150                | 400      | 100      | ---  |

## 3961--Pineval-Orovada-Beoska association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Pineval                                                                                    | Orovada  | Beoska   | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | ---      | 2-5                | 20-50    | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | ---      | ---                | 5-10     | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-15     | 2-10               | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 5-15     | 2-10               | ---      | ---      |
| Sandberg bluegrass              | POSE         | ---                                                                                        | ---      | 2-5      | 2-5                | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | ---      | 1-3      | ---                | ---      | ---      |
| Webber ricegrass                | ORWE         | ---                                                                                        | ---      | ---      | 2-10               | ---      | ---      |
| Desert needlegrass              | STSP3        | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Pine bluegrass                  | POSC         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | ---      | ---                | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | ---      | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | ---                | ---      | 15-20    |
| Eriogonum                       | ERIOG        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---      | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | ---      | ---                | 2-4      | ---      |
| Hawksbeard                      | CREPI        | ---                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | 2-8      | ---                | ---      | 5-10     |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---      | 10-25              | 15-20    | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---      | 2-5                | 2-5      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | 2-5      | 5-15               | 2-5      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | 30-40    | 10-25              | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | ---      | 20-30    | 2-5                | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | ---      | 2-5      | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 10-15    |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---      | ---                | 2-10     | 2-5      |
| Range site number               |              | O24X005N                                                                                   | O24X005N | O24X002N | O24X026N           | O24X005N | O25X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 700      | 400                | 800      | 2,500    |
| Normal years                    |              | 600                                                                                        | 600      | 450      | 300                | 600      | 1,900    |
| Unfavorable years               |              | 400                                                                                        | 400      | 300      | 200                | 400      | 1,200    |

3990--Settlemeier fine sandy loam, drained, 0 to 4 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |          |
|                                 |              | Settlemeier                                                                                | 1                  | 2        | 3        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | 50-60              | ---      | ---      |
| Nevada bluegrass                | PONE3        | 5-15                                                                                       | ---                | ---      | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | ---                | ---      | 2-10     |
| Sedge                           | CAREX        | 1-5                                                                                        | ---                | ---      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | 5-15               | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---                | 20-50    | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---                | 5-10     | ---      |
| Wildrye                         | ELMYU        | ---                                                                                        | ---                | ---      | 30-60    |
| Inland saltgrass                | DIST         | ---                                                                                        | ---                | ---      | 5-10     |
| Other perennial grasses         | PPGG         | 15-20                                                                                      | ---                | ---      | 5-15     |
| Balsamroot                      | BALSA        | ---                                                                                        | ---                | 2-4      | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---                | 2-4      | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | ---                | ---      | 2-5      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 2-8                | ---      | 5-10     |
| Basin big sagebrush             | ARTRT*       | 10-15                                                                                      | 15-20              | ---      | 2-5      |
| Black greasewood                | SAVE4        | ---                                                                                        | 2-10               | ---      | ---      |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | 2-5                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---                | 15-20    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---                | 2-5      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---                | 2-5      | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---                | ---      | 5-10     |
| Silver sagebrush                | ARCA13       | ---                                                                                        | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | 2-5                                                                                        | ---                | 2-10     | 2-8      |
| Range site number               |              | 025X003N                                                                                   | 024X006N           | 024X005N | 025X001N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |          |
| Favorable years                 |              | 2,500                                                                                      | 1,500              | 800      | 3,000    |
| Normal years                    |              | 1,900                                                                                      | 1,100              | 600      | 2,500    |
| Unfavorable years               |              | 1,200                                                                                      | 600                | 400      | 1,800    |

## 3992--Settlemeier, drained-Settlemeier loams

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |             |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|-------------|--------------------|----------|
|                                 |              | Soil name                                                                                  |             | Inclusion number-- |          |
|                                 |              | Settlemeier, drained                                                                       | Settlemeier | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | ---         | ---                | 50-60    |
| Nevada bluegrass                | PONE3        | 5-15                                                                                       | 5-10        | ---                | ---      |
| Mat muhly                       | MURI         | 2-10                                                                                       | 2-10        | ---                | ---      |
| Sedge                           | CAREX        | 1-5                                                                                        | ---         | ---                | ---      |
| Wildrye                         | ELMYU        | ---                                                                                        | 30-60       | ---                | ---      |
| Inland saltgrass                | DIST         | ---                                                                                        | 5-10        | ---                | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---         | 20-50              | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---         | 5-10               | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---         | ---                | 5-15     |
| Other perennial grasses         | PPGG         | 15-20                                                                                      | 5-15        | ---                | ---      |
| Sierra clover                   | TRWO         | ---                                                                                        | 2-5         | ---                | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---         | 2-4                | ---      |
| Tapertip hawksbeard             | CRAC2        | ---                                                                                        | ---         | 2-4                | ---      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 5-10        | ---                | 2-8      |
| Basin big sagebrush             | ARTRT*       | 10-15                                                                                      | 2-5         | ---                | 15-20    |
| Willow                          | SALIX        | ---                                                                                        | 5-10        | ---                | ---      |
| Silver sagebrush                | ARCA13       | ---                                                                                        | 2-5         | ---                | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---         | 15-20              | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---         | 2-5                | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---         | 2-5                | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---         | ---                | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---         | ---                | 2-5      |
| Other shrubs                    | SSSS         | 2-5                                                                                        | 2-8         | 2-10               | ---      |
| Range site number               |              | 025X003N                                                                                   | 025X001N    | 024X005N           | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |             |                    |          |
| Favorable years                 |              | 2,500                                                                                      | 3,000       | 800                | 1,500    |
| Normal years                    |              | 1,900                                                                                      | 2,500       | 600                | 1,100    |
| Unfavorable years               |              | 1,200                                                                                      | 1,800       | 400                | 600      |



## 4051--Attella-Xine-Kram association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |
|                                 |              | Attella                                                                                    | Xine     | Kram     | 1                  | 2        |
| Bluebunch wheatgrass            | AGSP         | X                                                                                          | 20-30    | X        | ---                | ---      |
| Basin wildrye                   | ELCI2        | X                                                                                          | 2-15     | ---      | ---                | 50-60    |
| Thurber needlegrass             | STTH2        | X                                                                                          | 2-10     | X        | ---                | ---      |
| Nevada bluegrass                | PONE3        | X                                                                                          | ---      | ---      | ---                | 5-15     |
| Idaho fescue                    | FEID         | X                                                                                          | 20-40    | ---      | ---                | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | X        | ---                | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | X        | ---                | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | ---                | 2-10     |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | ---                | 1-5      |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | X        | ---                | 15-20    |
| Tapertip hawksbeard             | CRAC2        | X                                                                                          | 1-5      | X        | ---                | ---      |
| Arrowleaf balsamroot            | BASA3        | X                                                                                          | 1-5      | X        | ---                | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | X        | ---                | 5-10     |
| Big sagebrush                   | ARTR2        | X                                                                                          | ---      | ---      | ---                | ---      |
| Snowberry                       | SYMPH        | X                                                                                          | ---      | ---      | ---                | ---      |
| Currant                         | RIBES        | X                                                                                          | ---      | ---      | ---                | ---      |
| Mountain big sagebrush          | ARTRV        | ---                                                                                        | 5-15     | ---      | ---                | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | X        | ---                | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | X        | ---                | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | 10-15    |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | X        | ---                | 2-5      |
| Singleleaf pinyon               | PIMO         | X                                                                                          | ---      | X        | ---                | ---      |
| Utah juniper                    | JUOS         | X                                                                                          | ---      | X        | ---                | ---      |
| Range site number               |              | 025X062N                                                                                   | 024X021N | 025X063N | None               | 025X003N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |
| Favorable years                 |              | 500                                                                                        | 1,400    | 400      | ---                | 2,500    |
| Normal years                    |              | 350                                                                                        | 1,000    | 250      | ---                | 1,900    |
| Unfavorable years               |              | 200                                                                                        | 700      | 150      | ---                | 1,200    |

## 4070--Genaw-Wieland-Grina association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Genaw                                                                                      | Wieland  | Grina    | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 20-50                                                                                      | 20-50    | X        | ---                | 5-10     | ---      |
| Bluebunch wheatgrass            | AGSP         | 5-10                                                                                       | 5-10     | X        | ---                | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | X        | ---                | 15-30    | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | ---      | X        | 50-60              | ---      | 50-60    |
| Nevada bluegrass                | PONE3        | ---                                                                                        | ---      | ---      | 5-15               | ---      | ---      |
| Mat muhly                       | MURI         | ---                                                                                        | ---      | ---      | 2-10               | ---      | ---      |
| Sedge                           | CAREX        | ---                                                                                        | ---      | ---      | 1-5                | ---      | ---      |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---      | ---                | T-2      | ---      |
| Western wheatgrass              | AGSM         | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | ---      | 15-20              | 5-15     | ---      |
| Balsamroot                      | BALSA        | 2-4                                                                                        | 2-4      | ---      | ---                | ---      | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-4                                                                                        | 2-4      | X        | ---                | ---      | ---      |
| Arrowleaf balsamroot            | BASA3        | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | ---                | 2-4      | ---      |
| Other perennial forbs           | PPFF         | ---                                                                                        | ---      | ---      | 5-10               | ---      | 2-8      |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | ---      | ---                | 15-30    | ---      |
| Downy rabbitbrush               | CHVIP        | 2-5                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | 2-5                                                                                        | 2-5      | ---      | ---                | 2-5      | ---      |
| Big sagebrush                   | ARTR2        | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | 10-15              | ---      | 15-20    |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | ---                | 2-5      | ---      |
| Black greasewood                | SAVE4        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Rubber rabbitbrush              | CHNA2        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-5      |
| Other shrubs                    | SSSS         | 2-10                                                                                       | 2-10     | ---      | 2-5                | 2-5      | ---      |
| Utah juniper                    | JUOS         | ---                                                                                        | ---      | X        | ---                | ---      | ---      |
| Range site number               |              | 024X005N                                                                                   | 024X005N | 025X059N | 025X003N           | 024X045N | 024X006N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 500      | 2,500              | 350      | 1,500    |
| Normal years                    |              | 600                                                                                        | 600      | 350      | 1,900              | 200      | 1,100    |
| Unfavorable years               |              | 400                                                                                        | 400      | 200      | 1,200              | 100      | 600      |

## 4071--Genaw-Perlor-Puett association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Genaw                                                                                      | Perlor   | Puett    | 1                  | 2        | 3        |
| Thurber needlegrass             | STTH2        | 10-20                                                                                      | ---      | ---      | 10-20              | 20-50    | 10-15    |
| Indian ricegrass                | ORHY         | 5-15                                                                                       | 5-15     | 10-30    | 5-15               | ---      | 10-15    |
| Bottlebrush squirreltail        | SIHY         | 2-10                                                                                       | 5-15     | 5-10     | 2-10               | ---      | ---      |
| Sandberg bluegrass              | POSE         | 2-10                                                                                       | 2-5      | ---      | 2-10               | ---      | ---      |
| Needleandthread                 | STCO4        | ---                                                                                        | 1-3      | ---      | ---                | ---      | ---      |
| Bluebunch wheatgrass            | AGSP         | ---                                                                                        | ---      | ---      | ---                | 5-10     | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 10-20    | ---                | ---      | 5-20     |
| Tapertip hawksbeard             | CRAC2        | 1-2                                                                                        | ---      | ---      | 1-2                | 2-4      | ---      |
| Globemallow                     | SPHAE        | 1-2                                                                                        | ---      | ---      | 1-2                | ---      | 2-5      |
| Phlox                           | PHLOX        | 1-2                                                                                        | ---      | ---      | 1-2                | ---      | ---      |
| Balsamroot                      | BALSA        | ---                                                                                        | ---      | ---      | ---                | 2-4      | ---      |
| Other perennial forbs           | PFFF         | ---                                                                                        | 2-8      | 5-15     | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | 30-35                                                                                      | ---      | 10-25    | 30-35              | 15-20    | ---      |
| Spiny hopsage                   | GRSP         | 5-15                                                                                       | 2-5      | 1-5      | 5-15               | 2-5      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | 30-40    | ---      | ---                | ---      | ---      |
| Bud sagebrush                   | ARSP5        | ---                                                                                        | 20-30    | ---      | ---                | ---      | ---      |
| Winterfat                       | EULA5        | ---                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 1-5      | ---                | 2-5      | ---      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | 1-5      | ---                | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | ---      | 25-35    |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | T-5      | ---                | ---      | ---      |
| Other shrubs                    | SSSS         | ---                                                                                        | ---      | 2-4      | ---                | 2-10     | 5-35     |
| Range site number               |              | 024X020N                                                                                   | 024X002N | 025X025N | 024X020N           | 024X005N | 024X030N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 700                                                                                        | 700      | 200      | 700                | 800      | 500      |
| Normal years                    |              | 450                                                                                        | 450      | 150      | 450                | 600      | 350      |
| Unfavorable years               |              | 300                                                                                        | 300      | 100      | 300                | 400      | 250      |

## 4072--Genaw-Orovada-Puett association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |          | Inclusion number-- |          |          |
|                                 |              | Genaw                                                                                      | Orovada  | Puett    | 1                  | 2        | 3        |
| Indian ricegrass                | ORHY         | 20-30                                                                                      | 20-30    | 10-30    | 15-30              | 10-15    | 10-20    |
| Needleandthread                 | STCO4        | 10-20                                                                                      | 10-20    | ---      | ---                | ---      | 20-30    |
| Bottlebrush squirreltail        | SIHY         | 5-10                                                                                       | 5-10     | 5-10     | ---                | ---      | 2-5      |
| Sandberg bluegrass              | POSE         | 2-5                                                                                        | 2-5      | ---      | ---                | ---      | ---      |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---      | T-2                | ---      | ---      |
| Thurber needlegrass             | STTH2        | ---                                                                                        | ---      | ---      | 5-10               | 10-15    | ---      |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | ---      | ---                | 2-10     | ---      |
| Thickspike wheatgrass           | AGDA         | ---                                                                                        | ---      | ---      | ---                | ---      | 2-10     |
| Other perennial grasses         | PPGG         | ---                                                                                        | ---      | 10-20    | 5-15               | 5-20     | ---      |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | ---      | 2-4                | 2-5      | ---      |
| Other perennial forbs           | PPFF         | 2-5                                                                                        | 2-5      | 5-15     | ---                | ---      | 10-20    |
| Wyoming big sagebrush           | ARTRW*       | 15-20                                                                                      | 15-20    | 10-25    | 15-30              | ---      | T-5      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | ---      | 1-5      | ---                | ---      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | 1-5      | 2-5                | ---      | T-5      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | 1-5      | ---                | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15     | ---                | 25-35    | ---      |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | T-5      | ---                | ---      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---      | 2-5                | ---      | ---      |
| Basin big sagebrush             | ARTRT*       | ---                                                                                        | ---      | ---      | ---                | ---      | 5-15     |
| Other shrubs                    | SSSS         | 5-15                                                                                       | 5-15     | 2-4      | 2-5                | 5-35     | ---      |
| Range site number               |              | 028B010N                                                                                   | 028B010N | 025X025N | 024X045N           | 024X030N | 024X017N |
| Potential production (lb/acre): |              |                                                                                            |          |          |                    |          |          |
| Favorable years                 |              | 800                                                                                        | 800      | 200      | 350                | 500      | 900      |
| Normal years                    |              | 600                                                                                        | 600      | 150      | 200                | 350      | 700      |
| Unfavorable years               |              | 400                                                                                        | 400      | 100      | 100                | 250      | 500      |

## 4091--Coztur-Genaw association

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          | Inclusion number-- |          |          |
|                                 |              | Coztur                                                                                     | Genaw    | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | 5-10     | ---                | 5-10     | 20-30    |
| Thurber needlegrass             | STTH2        | 15-25                                                                                      | 20-50    | ---                | 20-50    | 15-25    |
| Nevada bluegrass                | PONE3        | 2-10                                                                                       | ---      | ---                | ---      | 2-10     |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 10-30              | ---      | ---      |
| Bottlebrush squirreltail        | SIHY         | ---                                                                                        | ---      | 5-10               | ---      | ---      |
| Other perennial grasses         | PPGG         | 10-15                                                                                      | ---      | 10-20              | ---      | 10-15    |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | 2-4      | ---                | 2-4      | 2-5      |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | ---      | ---                | ---      | 2-5      |
| Balsamroot                      | BALSA        | ---                                                                                        | 2-4      | ---                | 2-4      | ---      |
| Other perennial forbs           | PPFF         | 2-5                                                                                        | ---      | 5-15               | ---      | 2-5      |
| Big sagebrush                   | ARTR2        | 10-15                                                                                      | ---      | ---                | ---      | 10-15    |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | 15-20    | 10-25              | 15-20    | ---      |
| Downy rabbitbrush               | CHVIP        | ---                                                                                        | 2-5      | 1-5                | 2-5      | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | 2-5      | 1-5                | 2-5      | ---      |
| Antelope bitterbrush            | PUTR2        | ---                                                                                        | ---      | 1-5                | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 5-15               | ---      | ---      |
| Purple sage                     | SACA9        | ---                                                                                        | ---      | T-5                | ---      | ---      |
| Other shrubs                    | SSSS         | 5-10                                                                                       | 2-10     | 2-4                | 2-10     | 5-10     |
| Range site number               |              | 025X014N                                                                                   | 024X005N | 025X025N           | 024X005N | 025X014N |
| Potential production (lb/acre): |              |                                                                                            |          |                    |          |          |
| Favorable years                 |              | 1,000                                                                                      | 800      | 200                | 800      | 1,000    |
| Normal years                    |              | 800                                                                                        | 600      | 150                | 600      | 800      |
| Unfavorable years               |              | 600                                                                                        | 400      | 100                | 400      | 600      |

## 4093--Coztur-Teguro-Punchbowl association

[An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |          |           |                    |          |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|----------|-----------|--------------------|----------|----------|
|                                 |              | Soil name                                                                                  |          |           | Inclusion number-- |          |          |
|                                 |              | Coztur                                                                                     | Teguro   | Punchbowl | 1                  | 2        | 3        |
| Bluebunch wheatgrass            | AGSP         | 20-30                                                                                      | X        | ---       | 20-30              | ---      | X        |
| Thurber needlegrass             | STTH2        | 15-25                                                                                      | X        | 10-15     | 15-25              | 5-10     | X        |
| Nevada bluegrass                | PONE3        | 2-10                                                                                       | X        | ---       | 2-10               | ---      | ---      |
| Basin wildrye                   | ELCI2        | ---                                                                                        | X        | ---       | ---                | ---      | X        |
| Idaho fescue                    | FEID         | ---                                                                                        | X        | ---       | ---                | ---      | ---      |
| Indian ricegrass                | ORHY         | ---                                                                                        | ---      | 10-15     | ---                | 15-30    | X        |
| Bluegrass                       | POA++        | ---                                                                                        | ---      | 2-10      | ---                | ---      | X        |
| Galleta                         | HIJA         | ---                                                                                        | ---      | ---       | ---                | T-2      | ---      |
| Other perennial grasses         | PPGG         | 10-15                                                                                      | ---      | 5-20      | 10-15              | 5-15     | ---      |
| Tapertip hawksbeard             | CRAC2        | 2-5                                                                                        | X        | ---       | 2-5                | ---      | X        |
| Arrowleaf balsamroot            | BASA3        | 2-5                                                                                        | X        | ---       | 2-5                | ---      | X        |
| Globemallow                     | SPHAE        | ---                                                                                        | ---      | 2-5       | ---                | 2-4      | ---      |
| Other perennial forbs           | PPFF         | 2-5                                                                                        | ---      | ---       | 2-5                | ---      | ---      |
| Big sagebrush                   | ARTR2        | 10-15                                                                                      | X        | ---       | 10-15              | ---      | X        |
| Snowberry                       | SYMPH        | ---                                                                                        | X        | ---       | ---                | ---      | ---      |
| Currant                         | RIBES        | ---                                                                                        | X        | ---       | ---                | ---      | ---      |
| Black sagebrush                 | ARARN        | ---                                                                                        | ---      | 25-35     | ---                | ---      | ---      |
| Wyoming big sagebrush           | ARTRW*       | ---                                                                                        | ---      | ---       | ---                | 15-30    | ---      |
| Spiny hopsage                   | GRSP         | ---                                                                                        | ---      | ---       | ---                | 2-5      | ---      |
| Shadscale                       | ATCO         | ---                                                                                        | ---      | ---       | ---                | 2-5      | ---      |
| Douglas rabbitbrush             | CHVI8        | ---                                                                                        | ---      | ---       | ---                | ---      | X        |
| Other shrubs                    | SSSS         | 5-10                                                                                       | ---      | 5-35      | 5-10               | 2-5      | ---      |
| Singleleaf pinyon               | PIMO         | ---                                                                                        | X        | ---       | ---                | ---      | ---      |
| Utah juniper                    | JUOS         | ---                                                                                        | X        | ---       | ---                | ---      | X        |
| Range site number               |              | 025X014N                                                                                   | 025X062N | 024X030N  | 025X014N           | 024X045N | 025X059N |
| Potential production (lb/acre): |              |                                                                                            |          |           |                    |          |          |
| Favorable years                 |              | 1,000                                                                                      | 500      | 500       | 1,000              | 350      | 500      |
| Normal years                    |              | 800                                                                                        | 350      | 350       | 800                | 200      | 350      |
| Unfavorable years               |              | 600                                                                                        | 200      | 250       | 600                | 100      | 200      |

4140--Welch loam, drained, 2 to 8 percent slopes

[Absence of an entry indicates that the named plant is not a key species in the potential native plant community]

| Common plant name               | Plant symbol | Percentage composition and production (dry weight) of plants on major soils and inclusions |                    |          |
|---------------------------------|--------------|--------------------------------------------------------------------------------------------|--------------------|----------|
|                                 |              | Soil name                                                                                  | Inclusion number-- |          |
|                                 |              |                                                                                            | 1                  | 2        |
| Basin wildrye                   | ELCI2        | 50-60                                                                                      | 5-10               | ---      |
| Nevada bluegrass                | PONE3        | 5-15                                                                                       | ---                | 5-10     |
| Mat muhly                       | MURI         | 2-10                                                                                       | ---                | ---      |
| Sedge                           | CAREX        | 1-5                                                                                        | ---                | 5-10     |
| Bearded wheatgrass              | AGSU         | ---                                                                                        | 1-10               | ---      |
| Nodding brome                   | BRAN         | ---                                                                                        | 1-10               | ---      |
| Slender wheatgrass              | AGTR         | ---                                                                                        | 2-5                | ---      |
| Slender hairgrass               | DEEL         | ---                                                                                        | 2-5                | ---      |
| Tufted hairgrass                | DECA5        | ---                                                                                        | ---                | 30-60    |
| Alpine timothy                  | PHAL2        | ---                                                                                        | ---                | 5-10     |
| Meadow barley                   | HOBR2        | ---                                                                                        | ---                | 2-5      |
| Other perennial grasses         | PPGG         | 15-20                                                                                      | 5-10               | 2-10     |
| Sierra clover                   | TRWO         | ---                                                                                        | ---                | 2-5      |
| Cinquefoil                      | POTEN        | ---                                                                                        | ---                | 2-5      |
| Other perennial forbs           | PPFF         | 5-10                                                                                       | 10-20              | 10-20    |
| Basin big sagebrush             | ARTRT*       | 10-15                                                                                      | ---                | ---      |
| Woods rose                      | ROWO         | ---                                                                                        | 5-10               | ---      |
| Common chokecherry              | PRVI         | ---                                                                                        | 5-10               | ---      |
| Snowberry                       | SYMPH        | ---                                                                                        | 2-5                | ---      |
| Willow                          | SALIX        | ---                                                                                        | ---                | 2-5      |
| Other shrubs                    | SSSS         | 2-5                                                                                        | 5-10               | 2-5      |
| Range site number               |              | 025X003N                                                                                   | 028B025N           | 025X005N |
| Potential production (lb/acre): |              |                                                                                            |                    |          |
| Favorable years                 |              | 2,500                                                                                      | 1,700              | 2,000    |
| Normal years                    |              | 1,900                                                                                      | 1,300              | 1,700    |
| Unfavorable years               |              | 1,200                                                                                      | 900                | 1,000    |

# **NRCS Accessibility Statement**

---

The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at [ServiceDesk-FTC@ftc.usda.gov](mailto:ServiceDesk-FTC@ftc.usda.gov). For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at <http://offices.sc.egov.usda.gov/locator/app>.







SOIL LEGEND

- AREAS DOMINATED BY SOILS ON BOLSON AND SEMIBOLSON FLOORS
- 1

PLAYAS
- 2

WENDANE-GUND-BATAN: Level and nearly level, very deep, somewhat poorly drained and moderately well drained soils on alluvial flats, alluvial flat remnants, lake plains, and lake plain terraces
- 3

SONOMA-RIXIE-PARANAT: Level and nearly level, very deep, poorly drained soils on axial stream flood plains
- 4

WENDANE-BATAN-BUBUS: Level and nearly level, very deep, somewhat poorly drained, moderately well drained, and well drained soils on alluvial flats and alluvial flat remnants
- 5

TWEBA-WENDANE: Level to gently sloping, very deep, somewhat poorly drained and moderately well drained soils on axial stream flood plains and alluvial flats
- AREAS DOMINATED BY SOILS ON FAN PIEDMONTS AND FAN SKIRTS
- 6

BROYLES-CREEMON-WHOLAN: Nearly level and gently sloping, very deep, well drained soils on fan skirts and inset fans
- 7

OROVADA-BROYLES-SHABLISS: Nearly level to moderately steep, shallow or very deep, well drained soils on fan aprons, fan skirts, and fan piedmont remnants
- 8

BEOSKA-BROYLES-WHIRLO: Nearly level to moderately sloping, very deep, well drained soils on fan piedmont remnants, fan skirts, and inset fans
- 9

RICERT-OROVADA-TENABO: Nearly level to moderately sloping, shallow and very deep, well drained soils on fan piedmont remnants and fan skirts
- 10

BOULFLAT-OROVADA: Gently sloping and moderately sloping, moderately deep and very deep, well drained soils on fan piedmont remnants and fan skirts
- 11

BUFFARAN-ALLOR-CHIARA: Gently sloping to strongly sloping, shallow and very deep, well drained soils on fan piedmont remnants and fan skirts
- 12

BIOYA-CHIARA-CORTEZ: Gently sloping to strongly sloping, shallow and moderately deep, well drained soils on fan piedmont remnants

- AREAS DOMINATED BY SOILS ON FOOTHILLS AND LOW MOUNTAINS
- 13

MCVEGAS-STINGDORN-OLD CAMP: Gently sloping to steep, shallow, well drained soils on foothills
- 14

PUETT-WIELAND-GENAW: Gently sloping to strongly sloping, very deep, well drained soils on mountain valley fans and moderately steep and steep, shallow, well drained soils on low, rolling foothills
- 15

TESSFIVE-PUETT-GENAW: Strongly sloping to steep, shallow, well drained soils on foothills and low mountains
- 16

ROBSON-AKERUE-BUFFARAN: Moderately sloping to steep, shallow, well drained soils on foothills and low mountains
- 17

ROCA-TRUNK-ALLEY: Moderately sloping to very steep, moderately deep and very deep, well drained soils on foothills
- 18

OLD CAMP-COLBAR-RELUCTAN: Strongly sloping to steep, shallow and moderately deep, well drained soils on low mountains
- AREAS DOMINATED BY SOILS ON HIGH MOUNTAINS
- 19

SUMINE-CHEN-ROCK OUTCROP: Rock outcrop and gently sloping to steep, shallow and moderately deep, well drained soils on high mountains
- 20

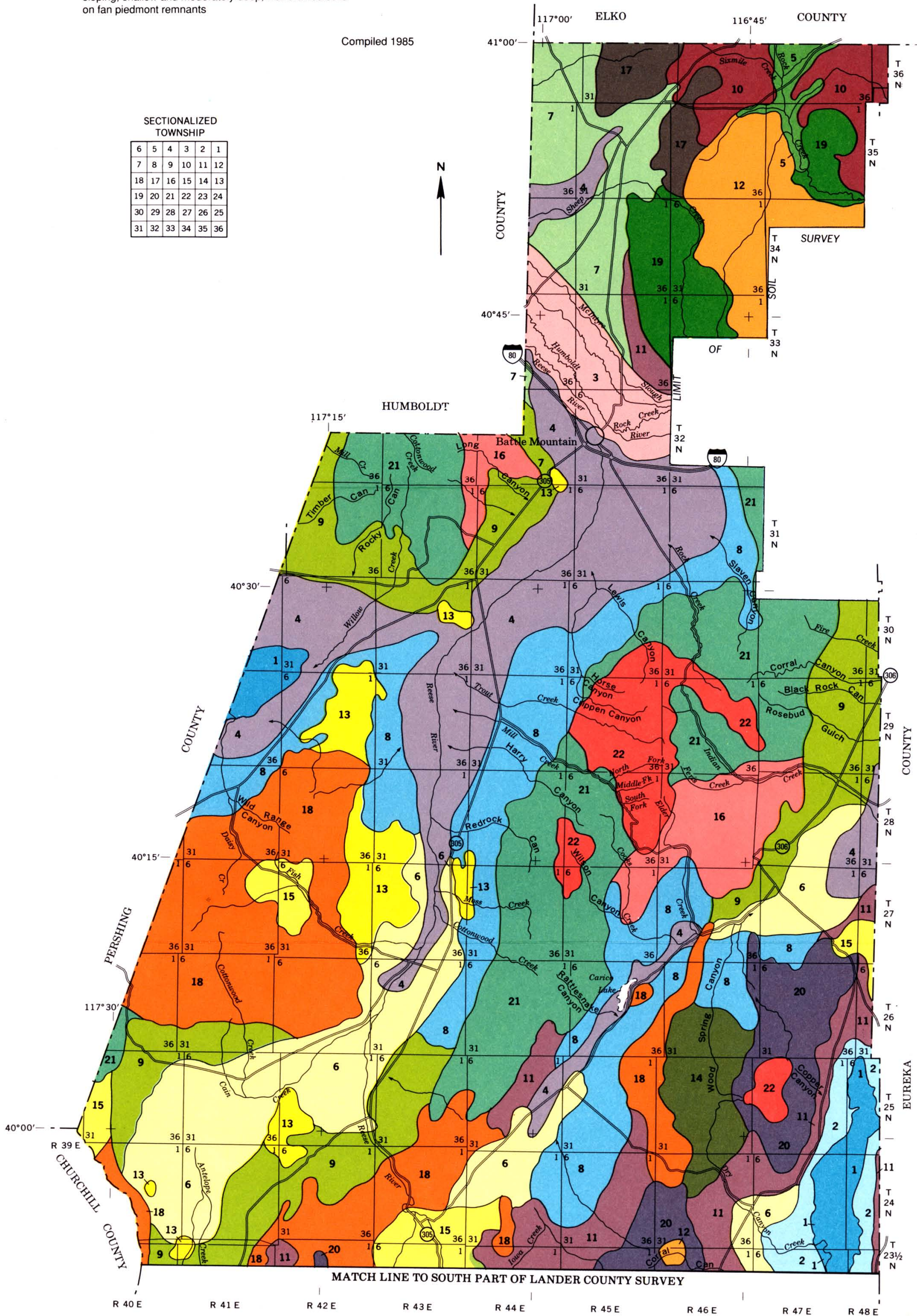
ITCA-RELUCTAN-PUNCHBOWL: Moderately steep and steep, shallow and moderately deep, well drained soils on high mountains
- 21

QUARZ-WALTI-GLEAN: Strongly sloping to steep, moderately deep and deep, well drained soils on high mountains
- 22

HAPGOOD-SUMINE-CLEAVAGE: Moderately steep to very steep, shallow, moderately deep and very deep, well drained soils on high mountains

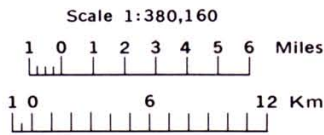
SECTIONALIZED TOWNSHIP

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| 6  | 5  | 4  | 3  | 2  | 1  |
| 7  | 8  | 9  | 10 | 11 | 12 |
| 18 | 17 | 16 | 15 | 14 | 13 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 30 | 29 | 28 | 27 | 26 | 25 |
| 31 | 32 | 33 | 34 | 35 | 36 |



UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
UNIVERSITY OF NEVADA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP  
LANDER COUNTY, NEVADA  
NORTH PART

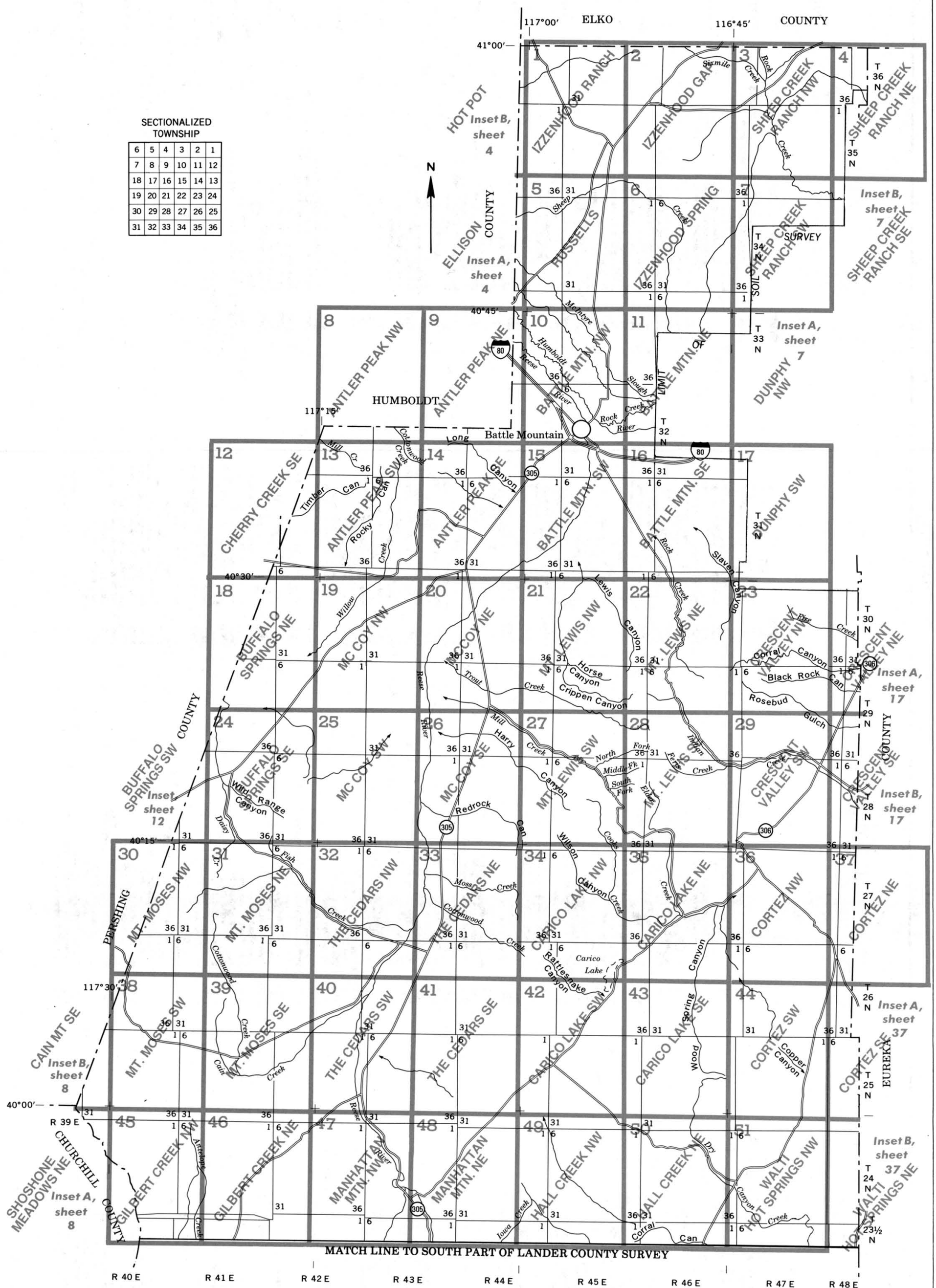


Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



SECTIONALIZED  
TOWNSHIP

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| 6  | 5  | 4  | 3  | 2  | 1  |
| 7  | 8  | 9  | 10 | 11 | 12 |
| 18 | 17 | 16 | 15 | 14 | 13 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 30 | 29 | 28 | 27 | 26 | 25 |
| 31 | 32 | 33 | 34 | 35 | 36 |

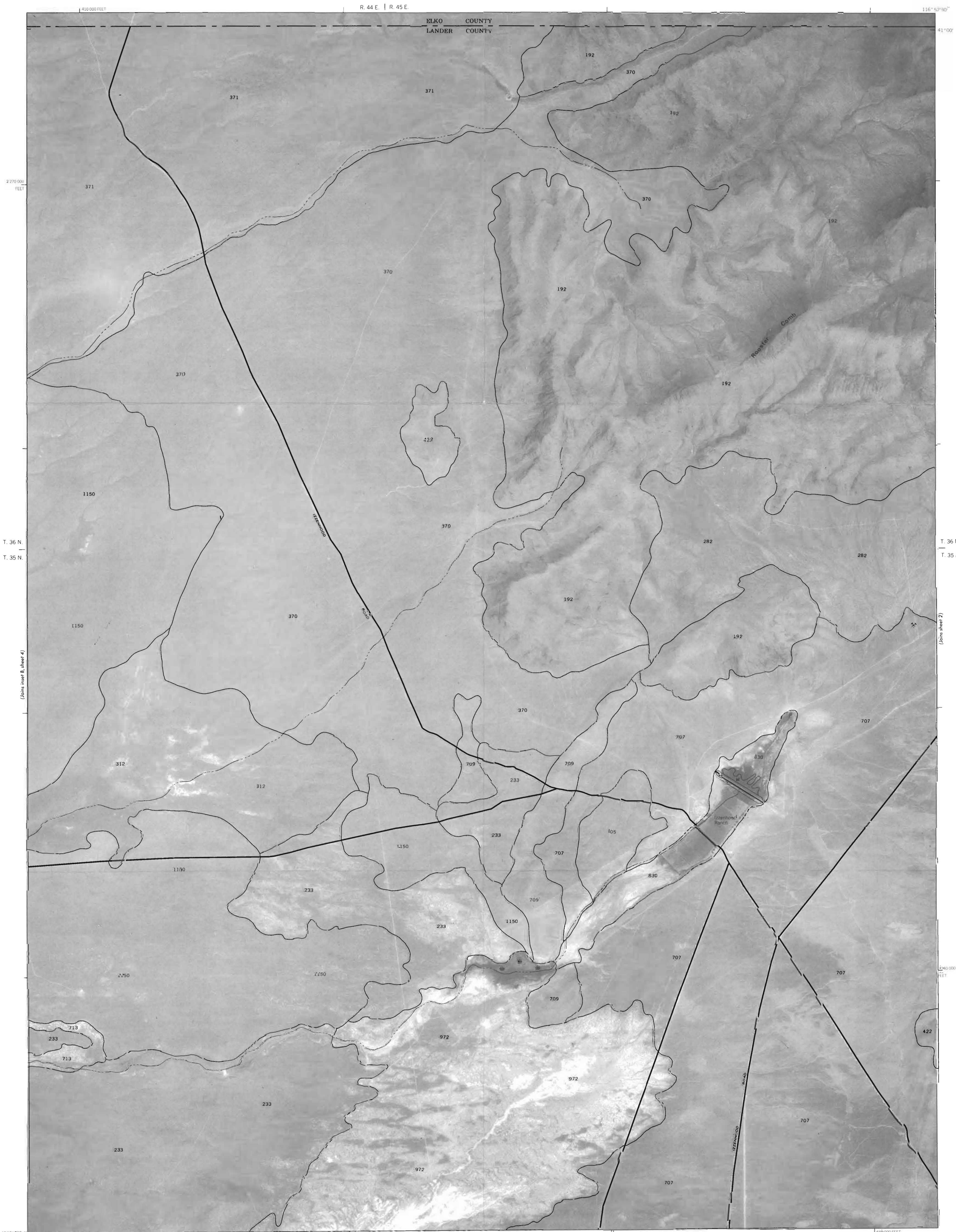


SOIL LEGEND

CONVENTIONAL AND SPECIAL  
SYMBOLS LEGEND

| SYMBOL |                                                                            | NAME |                                                                       | SYMBOL |                                                                             | NAME |                                                       | SYMBOL |                                                              | NAME                                                                           |  | National, state or province |  | MISCELLANEOUS CULTURAL FEATURES        |  | SOIL DELINEATIONS AND SYMBOLS          |  |
|--------|----------------------------------------------------------------------------|------|-----------------------------------------------------------------------|--------|-----------------------------------------------------------------------------|------|-------------------------------------------------------|--------|--------------------------------------------------------------|--------------------------------------------------------------------------------|--|-----------------------------|--|----------------------------------------|--|----------------------------------------|--|
| 102    | Beowawe Variant-Tomera-Whirilo association                                 | 312  | Davey fine sandy loam, cemented substratum *                          | 891    | Rosney loam, cemented substratum *                                          | 1422 | Sumine-Haggood-Cleavage association                   | 2801   | Old Camp-Rock outcrop-Colbar association, strongly sloping   | County or parish                                                               |  |                             |  | Farmstead, house (omit in urban areas) |  | ESCARPMENTS                            |  |
| 112    | Millerlux-Reluctan-Cleavage association                                    | 313  | Davey-Goldrun complex *                                               | 892    | Rosney silt loam *                                                          | 1423 | Sumine-Chen-Rock outcrop association                  | 2802   | Old Camp-Rock outcrop-Colbar association, steep              | Minor civil division                                                           |  |                             |  | Church                                 |  | Bedrock (points down slope)            |  |
| 120    | Alvan-Graley-Rock outcrop association                                      | 340  | Duffer very fine sandy loam *                                         | 971    | Soolake very fine sandy loam, 2 to 8 percent slopes *                       | 1425 | Sumine-Loncan association                             | 3071   | Alor-Wieland association                                     | Reservation (national forest or park, state forest or park, and large airport) |  |                             |  | School                                 |  | Other than bedrock (points down slope) |  |
| 130    | Alley-Dewar association                                                    | 370  | Enko fine sandy loam, 2 to 8 percent slopes                           | 972    | Soolake-Dunphy-Argenta association                                          | 1426 | Sumine-Cleavage-Loncan association                    | 3111   | Ninemile-Zoesta-Itca association                             | Land grant                                                                     |  |                             |  |                                        |  |                                        |  |
| 131    | Alley-Rock outcrop-Rubble land association                                 | 371  | Enko-Shabliss-Orovada association                                     | 980    | Sombiero very fine sandy loam *                                             | 1427 | Sumine-Itca-Softscrabble association                  | 3121   | Walti-Softscrabble-Bucan association                         | Limit of soil survey (label)                                                   |  |                             |  |                                        |  |                                        |  |
| 140    | Antel silt loam *                                                          | 400  | Glean-Walti-Cleavage association                                      | 990    | Sonoma silt loam, drained *                                                 | 1428 | Sumine-Rubble land-Cleavage association               | 3122   | Walti-Sumine-Softscrabble association                        | Field sheet matchline and neatline                                             |  |                             |  |                                        |  |                                        |  |
| 141    | Antel silt loam, moderately sodic *                                        | 411  | Golconda-Blackhawk association                                        | 991    | Sonoma silt loam, drained, slightly saline *                                | 1429 | Sumine-Winada Variant-Pernty association              | 3127   | Walti-Cleavage-Softscrabble association                      | AD HOC BOUNDARY (label)                                                        |  |                             |  |                                        |  |                                        |  |
| 142    | Antel silty clay loam *                                                    | 412  | Golconda-Dun Glen association                                         | 992    | Sonoma silt loam, strongly saline, rarely flooded *                         | 1450 | Atlow, steep-Atlow-Stingdorn association              | 3134   | Itca-Clanapine-Sumine association                            | Small airport, airfield, park, oilfield, cemetery, or flood pool               |  |                             |  |                                        |  |                                        |  |
| 143    | Antel silty clay loam, occasionally flooded *                              | 413  | Golconda-Blowmout land complex                                        | 993    | Sonoma silty clay loam, frequently flooded *                                | 1451 | Atlow-Reluctan-Trunk association                      | 3150   | Robson-Wiskan association                                    | STATE COORDINATE TICK                                                          |  |                             |  |                                        |  |                                        |  |
| 150    | Argenta very fine sandy loam *                                             | 420  | Goldrun fine sand, 0 to 4 percent slopes *                            | 994    | Sonoma silty clay loam, drained, strongly saline, occasionally flooded *    | 1452 | Atlow-Minat-Old camp association                      | 3152   | Robson-Reluctan association                                  | LAND DIVISION CORNER (sectors and land grants)                                 |  |                             |  |                                        |  |                                        |  |
| 152    | Argenta-Sonoma complex *                                                   | 422  | Goldrun-Old Camp association                                          | 995    | Sonoma silty clay loam, strongly saline, occasionally flooded *             | 1453 | Atlow-Colbar-Rock outcrop association                 | 3156   | Robson-Old Camp-Rock outcrop association                     | ROADS                                                                          |  |                             |  |                                        |  |                                        |  |
| 160    | Batan fine sandy loam *                                                    | 441  | Gund-Imberland association                                            | 996    | Sonoma, strongly saline-Sonoma complex *                                    | 1532 | Cleavage-Rubble land-Bregar association               | 3203   | Dewar-Sodhouse-Bojo association                              | Divided (median shown if scale permits)                                        |  |                             |  |                                        |  |                                        |  |
| 161    | Batan silt loam *                                                          | 442  | Gund-Bubus-Wendane association                                        | 997    | Sonoma silty clay loam, strongly saline, frequently flooded *               | 1542 | Linrose-Cleavage-Pernty association                   | 3410   | Zoesta-Wieland-Akerue association                            | Other roads                                                                    |  |                             |  |                                        |  |                                        |  |
| 162    | Batan silt loam, occasionally flooded *                                    | 443  | Gund-Batan association                                                | 1021   | Susie Creek-Millerlux association                                           | 1570 | Koynik-variant-Oxcotel-Whirilo association            | 3413   | Zoesta-Reluctan association                                  | Trail                                                                          |  |                             |  |                                        |  |                                        |  |
| 163    | Batan silt loam, slightly saline *                                         | 461  | Haggood-Packer-Layview association                                    | 1031   | Teman silt loam *                                                           | 1600 | Dumps and Pits, mine                                  | 3415   | Zoesta-Handy association                                     | ROAD EMBLEM & DESIGNATIONS                                                     |  |                             |  |                                        |  |                                        |  |
| 164    | Batan-Raglan-Rosney association                                            | 466  | Haggood-Tusel-Winada association                                      | 1032   | Teman silt loam, clayey substratum *                                        | 1601 | Pits, Gravel                                          | 3417   | Zoesta-Loncan-Welch association                              | Interstate                                                                     |  |                             |  |                                        |  |                                        |  |
| 166    | Batan-Wendane-Sonoma association                                           | 467  | Haggood-Sumine-Cleavage association                                   | 1033   | Teman silt loam, strongly saline *                                          | 1662 | Floor-Slaven-Roca association                         | 3420   | Belate-Sumine-Softscrabble association                       | Drainage end                                                                   |  |                             |  |                                        |  |                                        |  |
| 167    | Batan-Wendane-Vaimy association                                            | 482  | Humdun-Havingdon-Bucan association                                    | 1040   | Tenabo, gravely-Alor-Tenabo association                                     | 1670 | Wieland-Alor association                              | 3423   | Belate-Cleavage-Softscrabble association                     | Federal                                                                        |  |                             |  |                                        |  |                                        |  |
| 168    | Batan-Bubus-Ocala association                                              | 486  | Havingdon-Burrita association                                         | 1041   | Tenabo-Ricert association                                                   | 1671 | Wieland-Oxcotel-Alor association                      | 3432   | Bregar-Roca-Quarz association                                | State                                                                          |  |                             |  |                                        |  |                                        |  |
| 169    | Batan-Ocala-Ocala, rarely flooded, association                             | 511  | Hessing silt loam *                                                   | 1042   | Tenabo very gravely loam, 2 to 8 percent slopes                             | 1673 | Wieland-Grassval-Puett association                    | 3433   | Bregar-Punchbowl association                                 | County, farm or ranch                                                          |  |                             |  |                                        |  |                                        |  |
| 170    | Beoska silt loam, 0 to 2 percent slopes *                                  | 512  | Hessing-Relley association                                            | 1062   | Tomera-Snapp-Whirilo association                                            | 1680 | Zineb gravely loam, 2 to 8 percent slopes             | 3451   | Reluctan-Robson-Sumine association                           | RAILROAD                                                                       |  |                             |  |                                        |  |                                        |  |
| 171    | Beoska silt loam, 2 to 8 percent slopes *                                  | 530  | Humboldt fine sandy loam *                                            | 1080   | Trunk-Burita association                                                    | 1682 | Zineb-Doowak-Oxcotel association                      | 3452   | Reluctan-Sumine-Colbar association                           | POWER TRANSMISSION LINE (normally not shown)                                   |  |                             |  |                                        |  |                                        |  |
| 172    | Beoska-Tenabo silt loams, nearly level *                                   | 531  | Humboldt silty clay *                                                 | 1082   | Trunk-Reina association                                                     | 2060 | Oxcotel-Beoska-Whirilo association                    | 3453   | Reluctan-Locane-Itca association                             | PIPE LINE (normally not shown)                                                 |  |                             |  |                                        |  |                                        |  |
| 173    | Beoska-Tenabo silt loams, sloping *                                        | 532  | Humboldt silty clay loam, slightly saline *                           | 1084   | Trunk-Burrita-Rock outcrop association                                      | 2061 | Oxcotel-Whirilo-Dun Glen association                  | 3455   | Reluctan-Roca-Colbar association                             | FENCE (normally not shown)                                                     |  |                             |  |                                        |  |                                        |  |
| 174    | Beoska-Chiara association                                                  | 571  | Jenor-Blacks very fine sandy loams *                                  | 1085   | Trunk-Dewar-Stingdorn association                                           | 2062 | Oxcotel-Orovada association                           | 3560   | Locane-Robson-Bregar association                             | LEVEES                                                                         |  |                             |  |                                        |  |                                        |  |
| 175    | Beoska-Jenor association                                                   | 573  | Jenor-Beoska Broyles association                                      | 1086   | Trunk-Malpais-Minat association                                             | 2064 | Oxcotel-Misad association                             | 3561   | Locane-Sumine-Glean association                              | Without road                                                                   |  |                             |  |                                        |  |                                        |  |
| 177    | Beoska-Oxcotel-McConnel association                                        | 590  | Lando silt loam *                                                     | 1087   | Trunk-Burrita-Colbar association                                            | 2065 | Oxcotel-Oxcotel, moderately steep-Pineval association | 3564   | Locane-Zoesta-Bucan association                              | With road                                                                      |  |                             |  |                                        |  |                                        |  |
| 178    | Beoska-Malpais-Old Camp association                                        | 602  | Misad gravely sandy loam, strongly saline-sodic *                     | 1091   | Tulase silt loam, 2 to 8 percent slopes                                     | 2066 | Oxcotel-Broyles-Dun Glen association                  | 3621   | Minat-Bojo-Stingdorn association                             | With railroad                                                                  |  |                             |  |                                        |  |                                        |  |
| 181    | Beoska-Orovada association                                                 | 605  | Misad-Creemon-Rednik association                                      | 1092   | Tulase-Bubus-McConnel association                                           | 2067 | Oxcotel-Colbar-Stingdorn association                  | 3622   | Minat-Minat, eroded, association                             | DAMS                                                                           |  |                             |  |                                        |  |                                        |  |
| 182    | Beoska-Whirilo-Misad association                                           | 631  | McConnel-Tulase association                                           | 1102   | Tweba very fine sandy loam, drained, 0 to 4 percent slopes *                | 2068 | Oxcotel-Golconda-Whirilo association                  | 3624   | Minat-Colbar-Atlow association                               | Large (to scale)                                                               |  |                             |  |                                        |  |                                        |  |
| 183    | Beoska-Dewar-Orovada association                                           | 660  | Needle peak silt loam, occasionally flooded *                         | 1110   | Umlerland silty clay loam, ponded *                                         | 2069 | Oxcotel-Rednik-Veta association                       | 3650   | McVegas-Old Camp-Kingingham association                      | Medium or Small                                                                |  |                             |  |                                        |  |                                        |  |
| 185    | Beowawe silt loam *                                                        | 670  | Filiran-Pineval-Kingingham association                                | 1140   | Wendane silt loam, frequently flooded *                                     | 2090 | Punchbowl-Robson-Reluctan association                 | 3651   | McVegas-Beoska association                                   | PITS                                                                           |  |                             |  |                                        |  |                                        |  |
| 192    | Vanwyper-Trunk-Trunk, steep, association                                   | 680  | Skullwak-Umlerland-Wendane association                                | 1141   | Wendane silt loam, sandy substratum *                                       | 2091 | Punchbowl-Teguro-Sumine association                   | 3652   | McVegas-Stingdorn-Colbar association                         | Gravel pit                                                                     |  |                             |  |                                        |  |                                        |  |
| 193    | Berning-Alley association                                                  | 684  | Ocala silt loam, occasionally flooded *                               | 1142   | Wendane-Tweba association                                                   | 2092 | Punchbowl-Belate-Reluctan association                 | 3661   | Dun Glen-Whirilo association                                 | Mine or quarry                                                                 |  |                             |  |                                        |  |                                        |  |
| 200    | Sonoma Variant silt loam                                                   | 700  | Orovada fine sandy loam, 0 to 2 percent slopes *                      | 1143   | Wendane silt loam, occasionally flooded *                                   | 2094 | Punchbowl-Jung-Locane association                     | 3690   | Izod-Koynik-Rock outcrop association                         |                                                                                |  |                             |  |                                        |  |                                        |  |
| 202    | Boiya-Chiara-Cortez association                                            | 701  | Orovada fine sandy loam, 2 to 4 percent slopes *                      | 1144   | Wendane-Batan-Broyles association                                           | 2096 | Punchbowl-Clanapine-Sumine association                | 3691   | Izod-Rock outcrop association                                |                                                                                |  |                             |  |                                        |  |                                        |  |
| 203    | Boiya-Shabliss-Puett association                                           | 702  | Orovada fine sandy loam, cemented substratum, 0 to 2 percent slopes * | 1145   | Wendane-Playas association                                                  | 2099 | Punchbowl-Roca-Rock outcrop association               | 3693   | Izod-Attella-Xine association                                |                                                                                |  |                             |  |                                        |  |                                        |  |
| 211    | Blacka very fine sandy loam, 0 to 2 percent slopes *                       | 703  | Orovada-Goldrun complex *                                             | 1146   | Wendane-Sonoma-Vaimy association                                            | 2100 | Grassval-Grina-Unsel Variant association              | 3740   | Kelk silt loam, saline, 0 to 4 percent slopes *              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 212    | Blacka-Broyles very fine sandy loams, 2 to 8 percent slopes                | 704  | Orovada-Kodra-Puett association                                       | 1150   | Weso fine sandy loam *                                                      | 2104 | Grassval-Zineb-Izod association                       | 3741   | Kelk-Settemeyer association                                  |                                                                                |  |                             |  |                                        |  |                                        |  |
| 213    | Blacka-Broyles very fine sandy loams, saline, 2 to 4 percent slopes *      | 705  | Orovada-Creemon complex *                                             | 1158   | Whirilo very fine sandy loam, 2 to 4 percent slopes, occasionally flooded * | 2521 | Stingdorn very cobbly loam, 4 to 30 percent slopes    | 3742   | Kelk-Ocala association                                       |                                                                                |  |                             |  |                                        |  |                                        |  |
| 220    | Blackhawk very fine sandy loam, 2 to 8 percent slopes                      | 706  | Orovada-Wieland-Chiara association                                    | 1160   | Whirilo gravely loam, 2 to 8 percent slopes                                 | 2522 | Stingdorn-Stingdorn, steep-Colbar association         | 3840   | Jung-Norfolk-Buttaran association                            |                                                                                |  |                             |  |                                        |  |                                        |  |
| 230    | Broyles very fine sandy loam, 0 to 2 percent slopes                        | 707  | Orovada-Goldrun association                                           | 1162   | Whirilo silt loam, 0 to 2 percent slopes *                                  | 2530 | Perwick-Puett-Tulase association                      | 3841   | Jung-Itca-Roca association                                   |                                                                                |  |                             |  |                                        |  |                                        |  |
| 231    | Broyles very fine sandy loam, 2 to 4 percent slopes *                      | 708  | Orovada-Reina-Rock outcrop association                                | 1163   | Whirilo silt loam, 2 to 4 percent slopes *                                  | 2540 | Buttaran-Wieland association                          | 3843   | Jung, steep-Robson-Jung association                          |                                                                                |  |                             |  |                                        |  |                                        |  |
| 232    | Broyles very fine sandy loam, cemented substratum, 0 to 2 percent slopes * | 709  | Orovada-Sodhouse association                                          | 1165   | Whirilo-Creemon association                                                 | 2541 | Buttaran-Zoesta association                           | 3845   | Jung-Stingdorn-Atlow association                             |                                                                                |  |                             |  |                                        |  |                                        |  |
| 233    | Broyles very fine sandy loam, moderately saline, 0 to 2 percent slopes *   | 711  | Paranet silty clay loam *                                             | 1166   | Whirilo-Pumper silt loams *                                                 | 2550 | Laped-Old camp-Colbar association                     | 3846   | Jung-Wiskan association                                      |                                                                                |  |                             |  |                                        |  |                                        |  |
| 235    | Broyles-Creemon association                                                | 713  | Paranet silty clay loam, drained *                                    | 1168   | Whirilo-Oxcotel association                                                 | 2552 | Laped-Old Camp-Puett association                      | 3881   | Layview-Packer-Haggood association                           |                                                                                |  |                             |  |                                        |  |                                        |  |
| 237    | Broyles-Beoska-Orovada association                                         | 714  | Paranet silty clay loam, occasionally flooded *                       | 1169   | Whirilo-Broyles association                                                 | 2553 | Laped-Stingdorn-Colbar association                    | 3950   | Hooplite Jung-Izod association                               |                                                                                |  |                             |  |                                        |  |                                        |  |
| 240    | Bubus very fine sandy loam *                                               | 731  | Yipor silt loam, moderately saline-sodic *                            | 1170   | Wholan silt loam *                                                          | 2555 | Laped-Colbar association                              | 3961   | Pineval-Orovada-Beoska association                           |                                                                                |  |                             |  |                                        |  |                                        |  |
| 242    | Bubus very fine sandy loam, gravely substratum *                           | 740  | Playas                                                                | 1174   | Wholan silt loam, sandy substratum *                                        | 2561 | Puett-Genaw-Orovada association                       | 3990   | Settemeyer fine sandy loam, drained, 0 to 4 percent slopes * |                                                                                |  |                             |  |                                        |  |                                        |  |
| 243    | Bubus-Playas complex *                                                     | 770  | Pride silt loam *                                                     | 1177   | Wholan, strongly alkaline-Rasille association                               | 2571 | Colbar, steep-Burrita-Colbar association              | 3992   | Settemeyer, drained-Settemeyer loams *                       |                                                                                |  |                             |  |                                        |  |                                        |  |
| 244    | Bubus-Relley complex *                                                     | 771  | Pride-Sonoma silty clay loams *                                       | 1178   | Wholan-Rasille association                                                  | 2573 | Colbar-Midraw association                             | 4051   | Attella-Xine-Kram association                                |                                                                                |  |                             |  |                                        |  |                                        |  |
| 245    | Bubus-Needle Peak-Yipor association                                        | 780  | Pumper silt loam *                                                    | 1201   | Slaven-Linrose-Cleavage association                                         | 2575 | Colbar-Perwick-Settemeyer association                 | 4070   | Genaw-Wieland-Grina association                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 247    | Bubus-Lsolde association                                                   | 800  | Raglan silt loam, gravely substratum *                                | 1202   | Slaven-Wiskan-Graley Variant association                                    | 2591 | Osoll Variant-Oxcotel association                     | 4071   | Genaw-Perior-Puett association                               |                                                                                |  |                             |  |                                        |  |                                        |  |
| 248    | Bubus-Batan-Reese association                                              | 804  | Raglan silty clay loam, moderately saline *                           | 1203   | Slaven-Glean-Cleavage association                                           | 2600 | Grina-Caniwe-Handy association                        | 4072   | Genaw-Orovada-Puett association                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 251    | Bucan-Bucan,steep association                                              | 805  | Raglan silt loam *                                                    | 1212   | Wiskan-Roca-Bregar association                                              | 2602 | Grina-Grina, eroded-Caniwe association                | 4091   | Coztur-Genaw association                                     |                                                                                |  |                             |  |                                        |  |                                        |  |
| 252    | Bucan-Humdun-Rock outcrop association                                      | 814  | Quarz-Linrose-Slaven association                                      | 1215   | Wiskan-Locane association                                                   | 2620 | Handy-Caniwe-Zoesta association                       | 4093   | Coztur-Teguro-Punchbowl association                          |                                                                                |  |                             |  |                                        |  |                                        |  |
| 262    | Chen-Slaven-Chen, cobbly, association                                      | 816  | Quarz-Linrose-Cleavage association                                    | 1216   | Wiskan-Linrose association                                                  | 2621 | Handy, gravely-Handy Zoesta association               | 4140   | Welch loam, drained, 2 to 8 percent slopes                   |                                                                                |  |                             |  |                                        |  |                                        |  |
| 272    | Cherry Sprint-Enko association                                             | 830  | Reese silt loam *                                                     | 1220   | Boufflat-Havingdon-Dewar association                                        | 2631 | Midraw-Minat-Pineval association                      |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 282    | Chiara-Orovada association                                                 | 835  | Reese-Ocala association                                               | 1221   | Boufflat-Colbar-Old Camp association                                        | 2640 | Rasille-Kelk association                              |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 283    | Chiara-Tenabo association                                                  | 841  | Wendane-Variant silt loam *                                           | 1240   | Redflame-Kingingham association                                             | 2652 | Malpais-Stingdorn association                         |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 284    | Chiara-Dewar association                                                   | 850  | Relley silt loam *                                                    | 1263   | Graley-Loncan-Bregar association                                            | 2670 | Zoesta Variant Jung-McVegas association               |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 285    | Chiara-Trunk-Midraw association                                            | 851  | Relley silt loam, cemented substratum *                               | 1280   | Ricart-Oxcotel-Whirilo association                                          | 2681 | Testtve-Puett-Grina association                       |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 286    | Chiara-Jenor association                                                   | 852  | Relley silt loam, strongly saline *                                   | 1281   | Ricert-Whirilo-Pineval association                                          | 2711 | Burrita-Burnborough association                       |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 290    | Creemon silt loam, 0 to 2 percent slopes *                                 | 853  | Relley silty clay loam *                                              | 1283   | Ricert-Kingingham-Oxcotel association                                       | 2712 | Burrita-Alley-Newpass association                     |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 291    | Creemon silt loam, 2 to 4 percent slopes *                                 | 855  | Relley-Broyles association                                            | 1291   | Kingingham-Tenabo-Sodhouse association                                      | 2721 | Burnborough-Sumine-Burrita association                |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 292    | Creemon silt loam, 0 to 2 percent slopes, occasionally flooded *           | 861  | Rixie silty clay loam, strongly saline *                              | 1292   | Kingingham-Golconda-Whirilo association                                     | 2760 | Ginex-Burrita-Burrita, south aspect, association      |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 293    | Creemon silt loam, strongly saline, 0 to 2 percent slopes *                | 862  | Rixie silty clay loam, drained, strongly saline *                     | 1293   | Kingingham-Oxcotel association                                              | 2771 | Kram-Hopeka-Rock outcrop association                  |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 294    | Creemon-Orovada-Broyles association                                        | 863  | Rixie-Rixie, sodic, complex                                           | 1294   | Kingingham-Whirilo-Beoska association                                       | 2783 | Desatoya, steep-Spike-Desatoya association            |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 295    | Creemon-Cren association                                                   | 864  | Rixie silty clay loam *                                               | 1342   | Doowak, cobbly Doowak-Veta association                                      | 2790 | Old Camp-Minat-Osoll association                      |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 296    | Creemon-Hessing association                                                | 870  | Roca-Bregar-Linrose association                                       | 1392   | Rock outcrop-Loncan Variant-Glean association                               | 2791 | Old Camp-Colbar-Rock outcrop association              |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 297    | Creemon-Orovada-Tulase association                                         | 872  | Roca-Linrose-Wiskan association                                       | 1400   | Koynik, steep-Koynik-Rock outcrop association                               | 2793 | Old Camp-Laped association                            |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 298    | Creemon-Misad association                                                  | 873  | Roca-Reluctan association                                             | 1410   | Bojo-Stingdorn association                                                  | 2794 | Old Camp-Kram Variant-Rock outcrop association        |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 300    | Cren silt loam *                                                           | 875  | Roca-Glean-Bregar association                                         | 1411   | Bojo-Rock outcrop-Osoll association                                         | 2796 | Old Camp-Osoll-Colbar association                     |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 308    | Cren-Doowak-Relley association                                             | 881  | Rose Creek silt loam, drained, strongly saline *                      | 1412   | Bojo-Humdun-Boufflat association                                            | 2797 | Old Camp, steep-Colbar-Old Camp association           |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 304    | Cren-Raglan-Batan association                                              | 882  | Rose Creek silty clay loam *                                          | 1420   | Sumine-Reluctan-Cleavage association                                        | 2798 | Old Camp-Atlow-Osoll association                      |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |
| 310    | Davey fine sandy loam *                                                    | 883  | Rose Creek-Paranet silty clay loams *                                 | 1421   | Sumine-Softscrabble-Walti association                                       | 2800 | Old Camp-Walti-Softscrabble association               |        |                                                              |                                                                                |  |                             |  |                                        |  |                                        |  |





This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTH PART, SHEET NO. 1





This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTHERN PART NO. 2





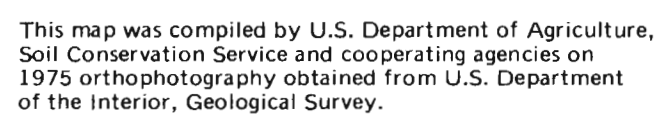
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTH PART, NO. 3









LANDER COUNTY, NEVADA, NORTHERN PART NO. 5

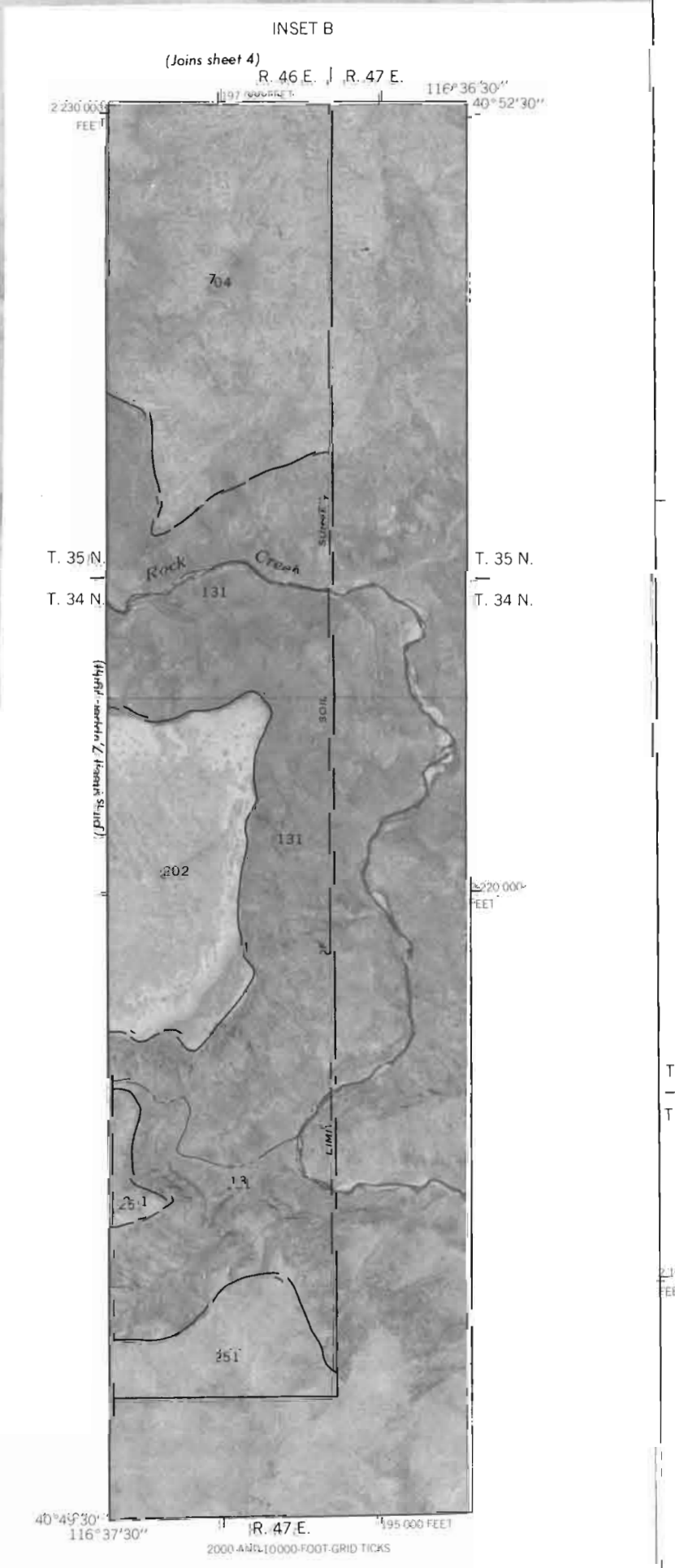
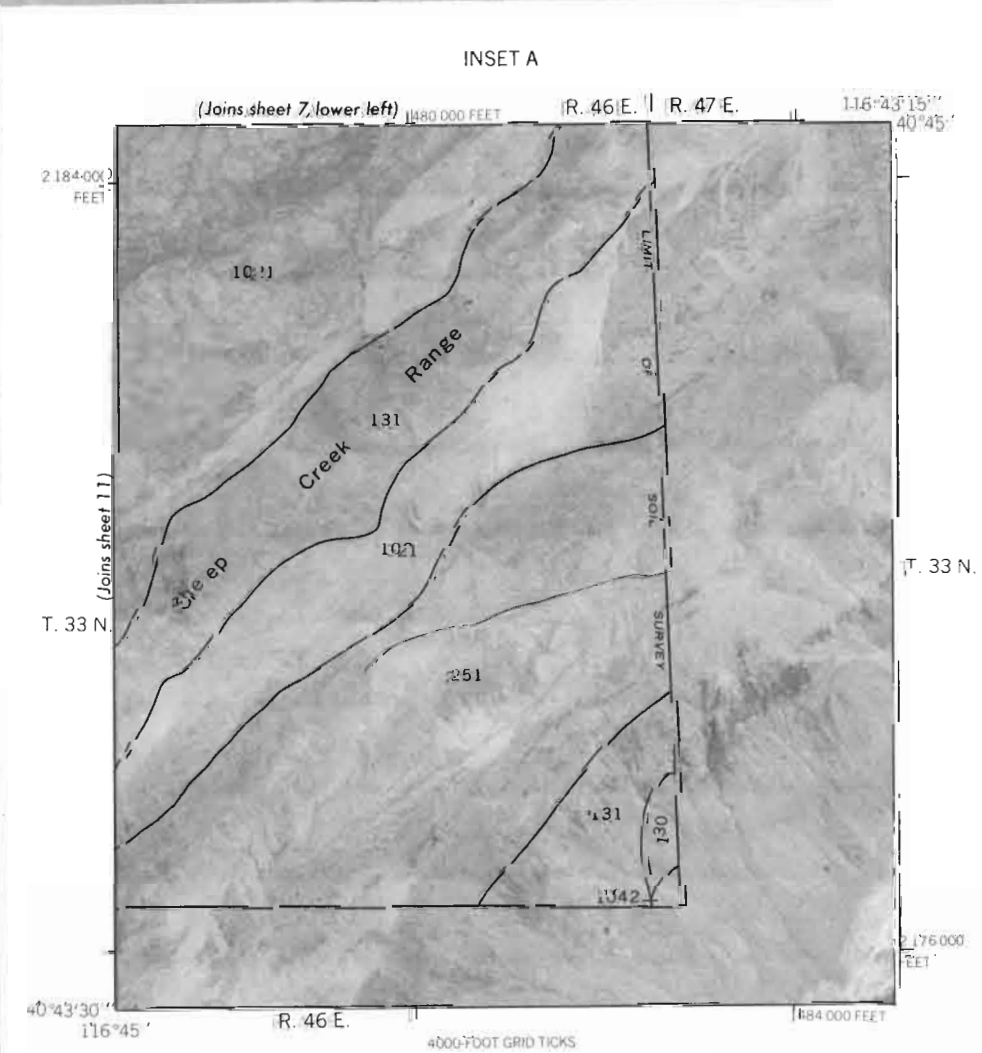




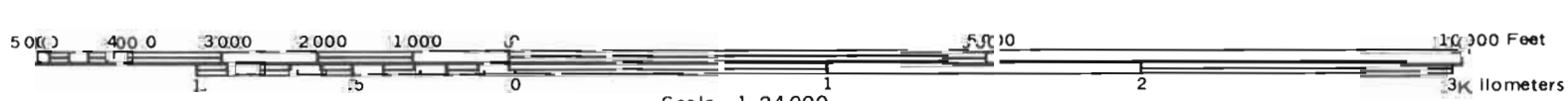
This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTHERN PART NO. 6



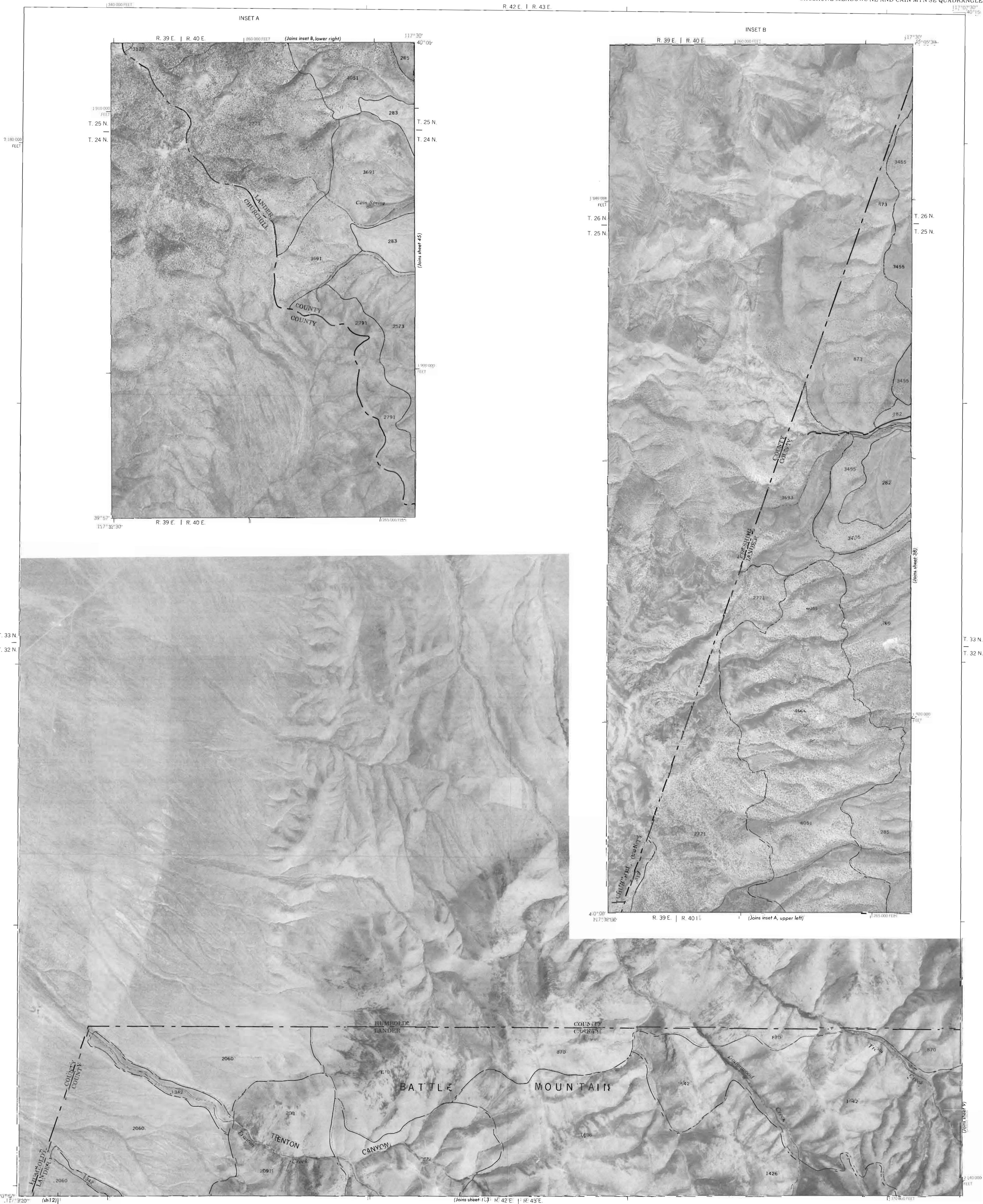


This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTHERN PART NO. 7

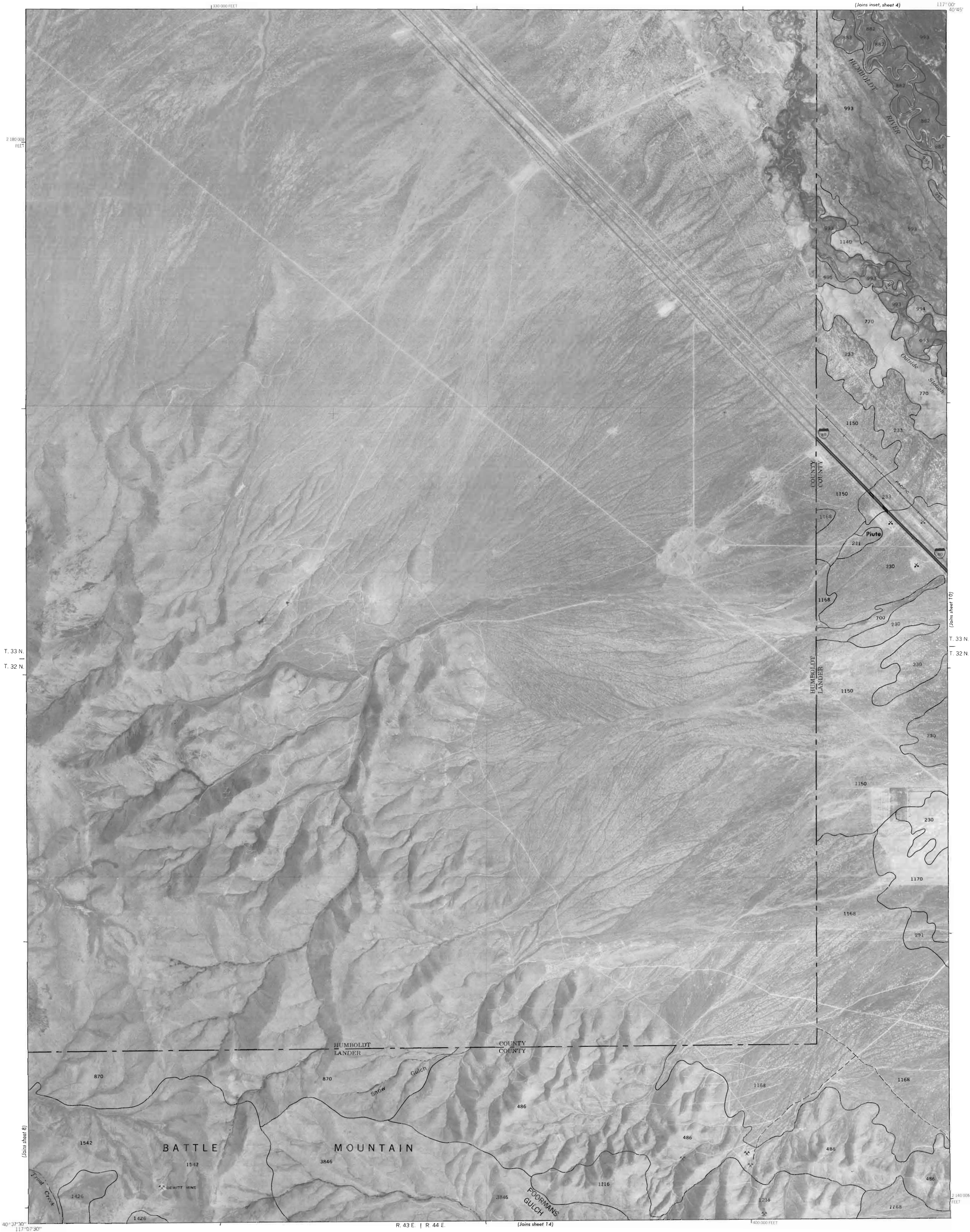




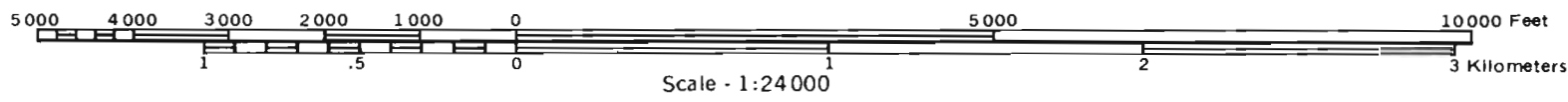
This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTHERN PART NO. 8



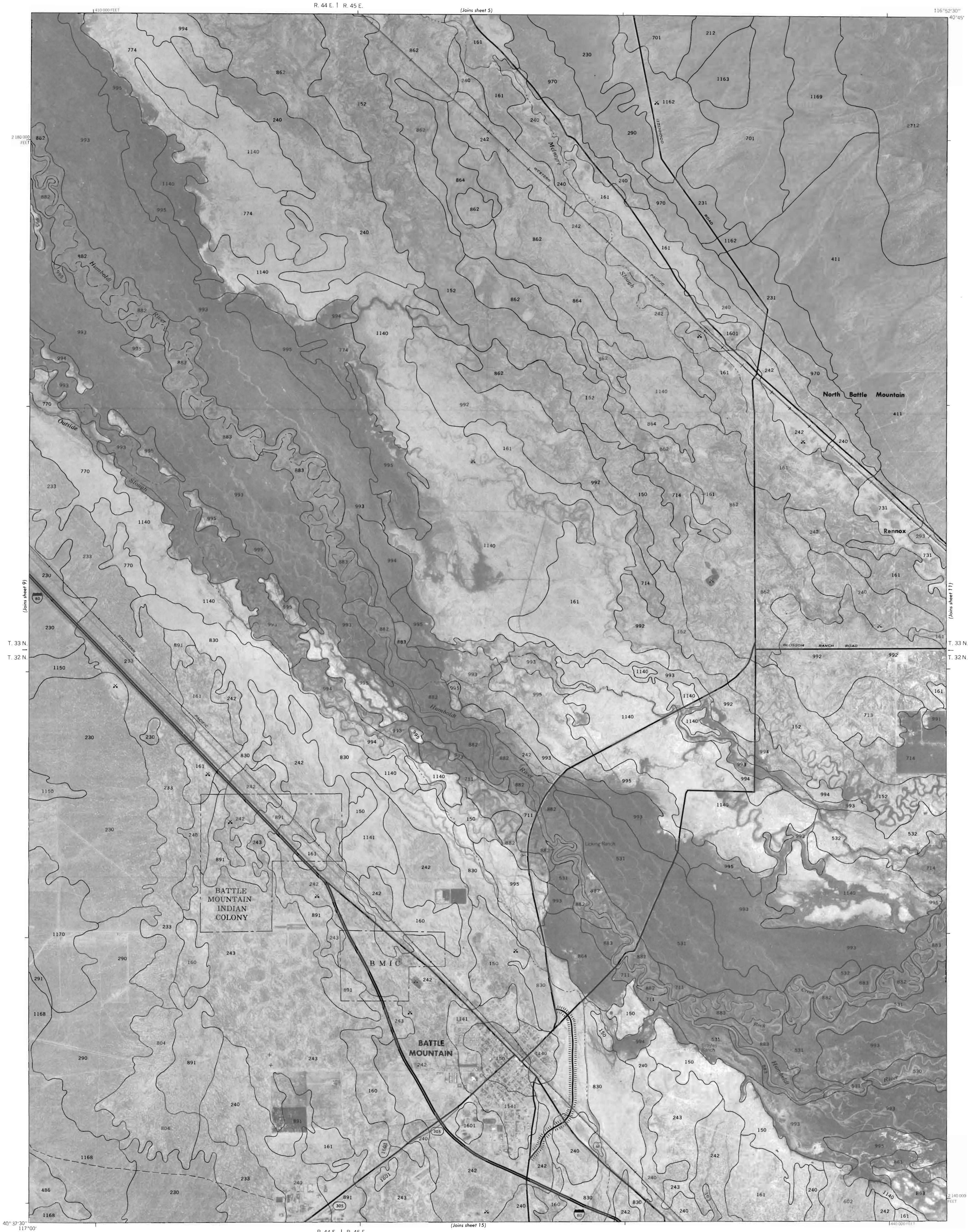


This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.

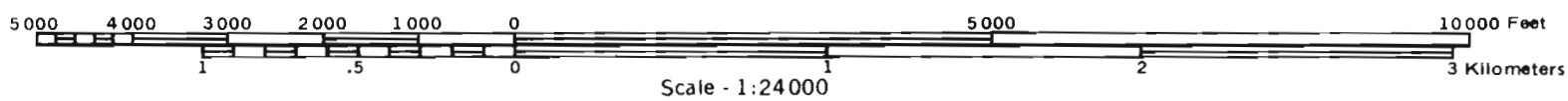


LANDER COUNTY, NEVADA, NORTHERN PART NO. 9



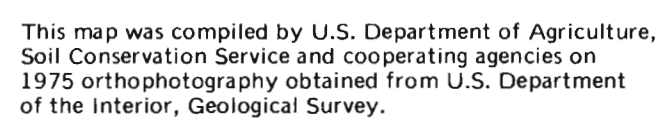


This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1980 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTHERN PART NO. 10

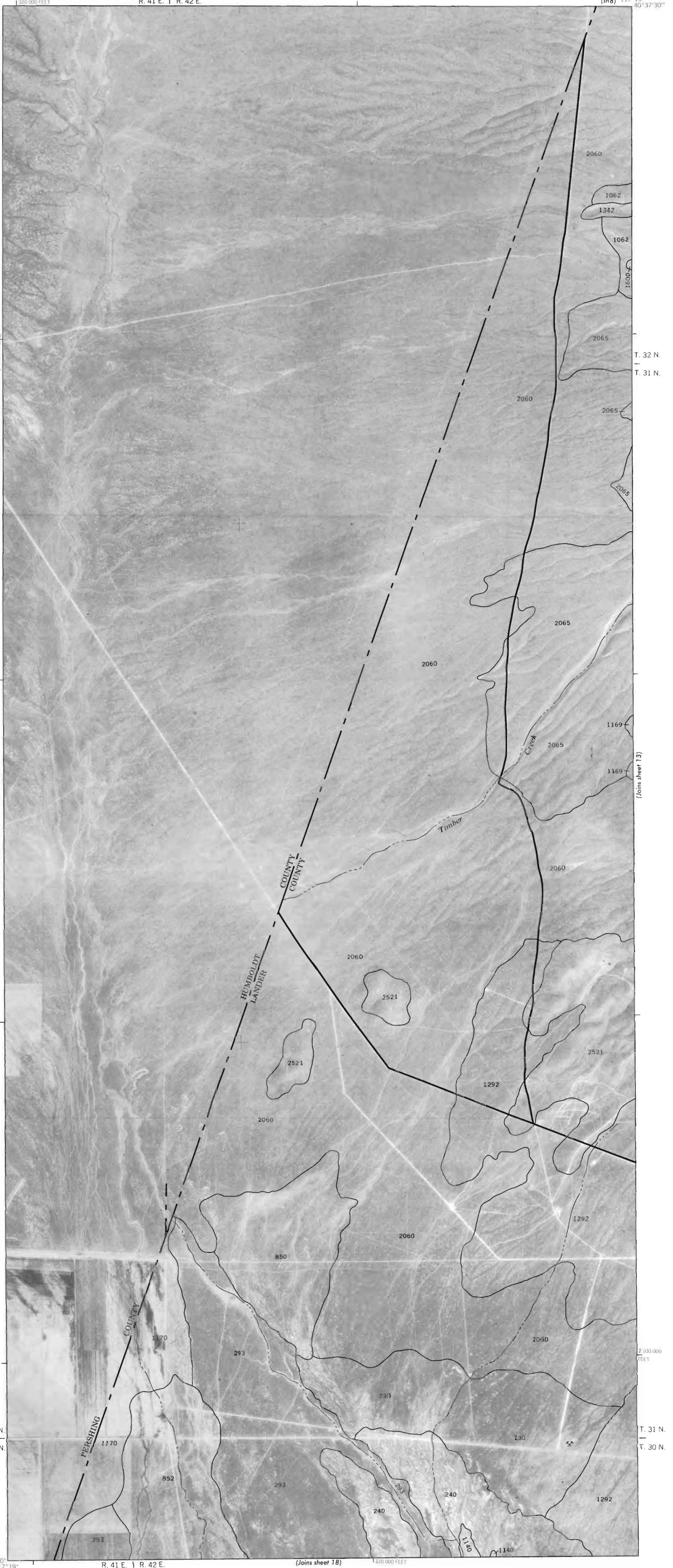




LANDER COUNTY, NEVADA, NORTHERN PART NO. 11



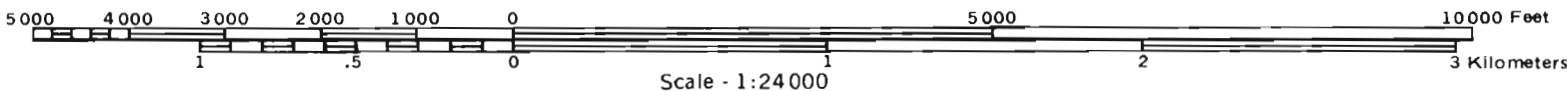
(sh8) 117°15'  
40°37'30''







This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTH PART NO. 13



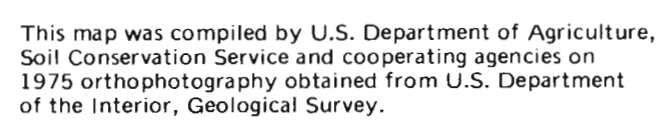




This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

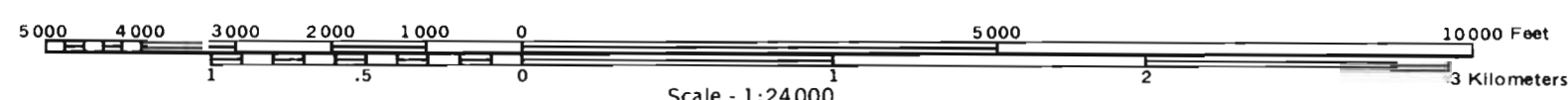
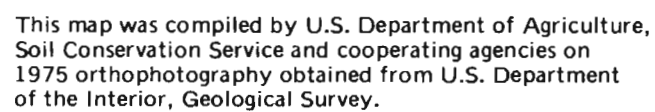
LANDER COUNTY, NEVADA, NORTHERN PART NO. 14





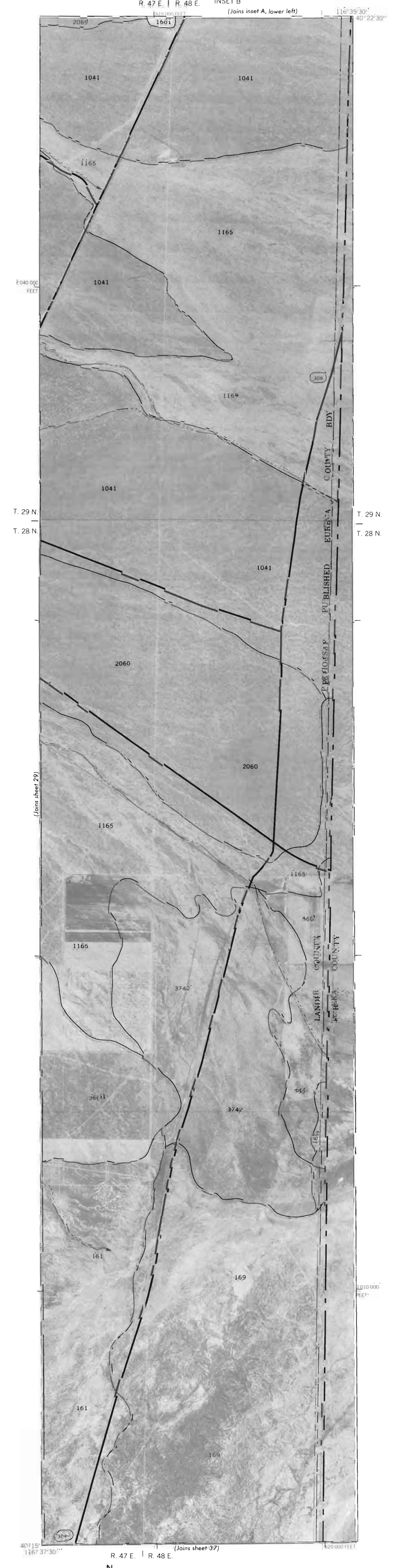
LANDER COUNTY, NEVADA, NORTHERN PART NO. 15





LANDER COUNTY, NEVADA, NORTHERN PART NO. 16





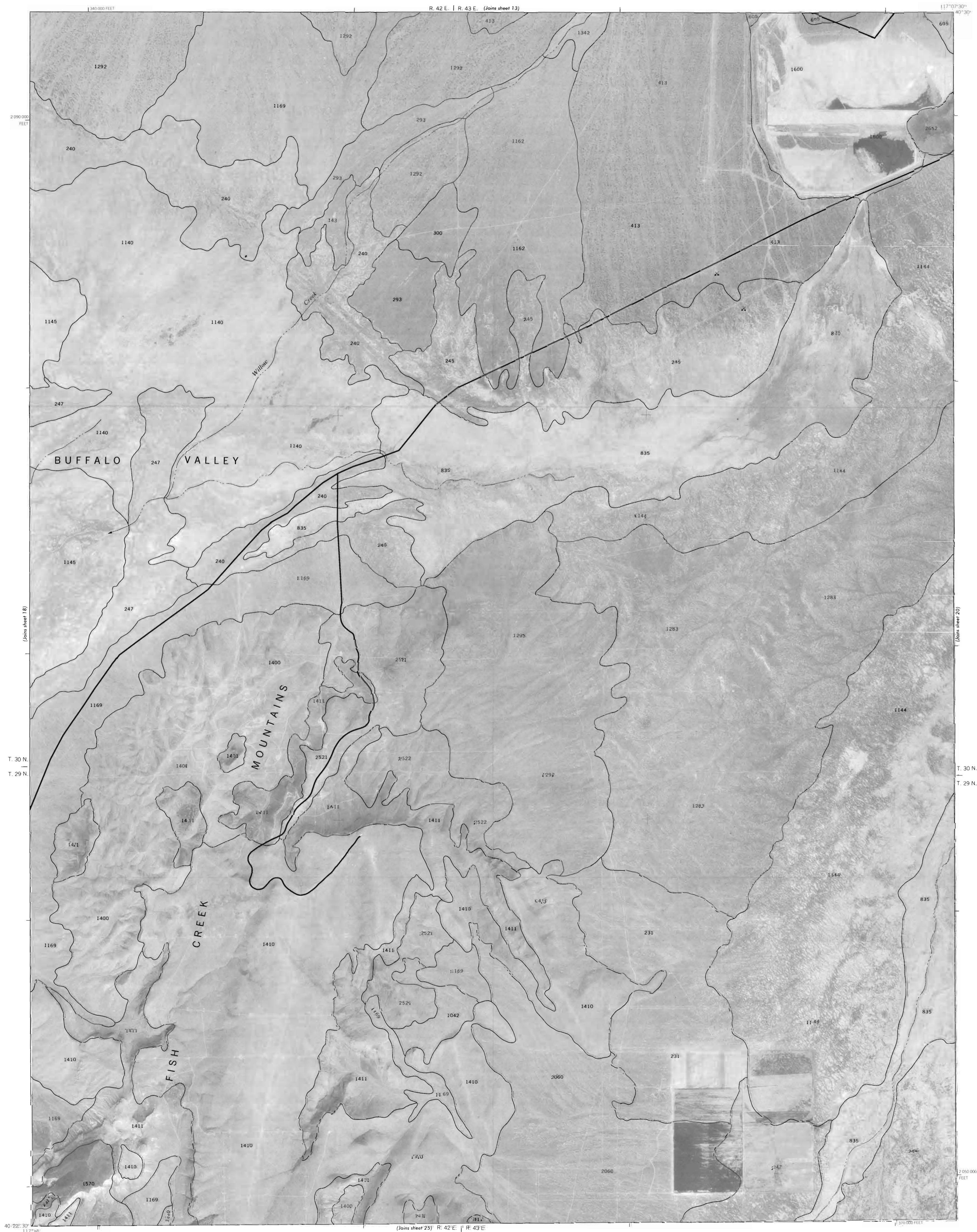




This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTH PART NO. 18

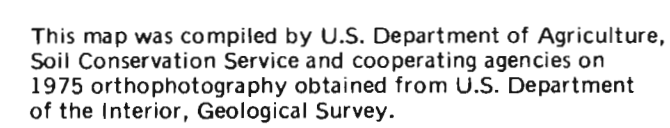




This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTHERN PART NO. 19





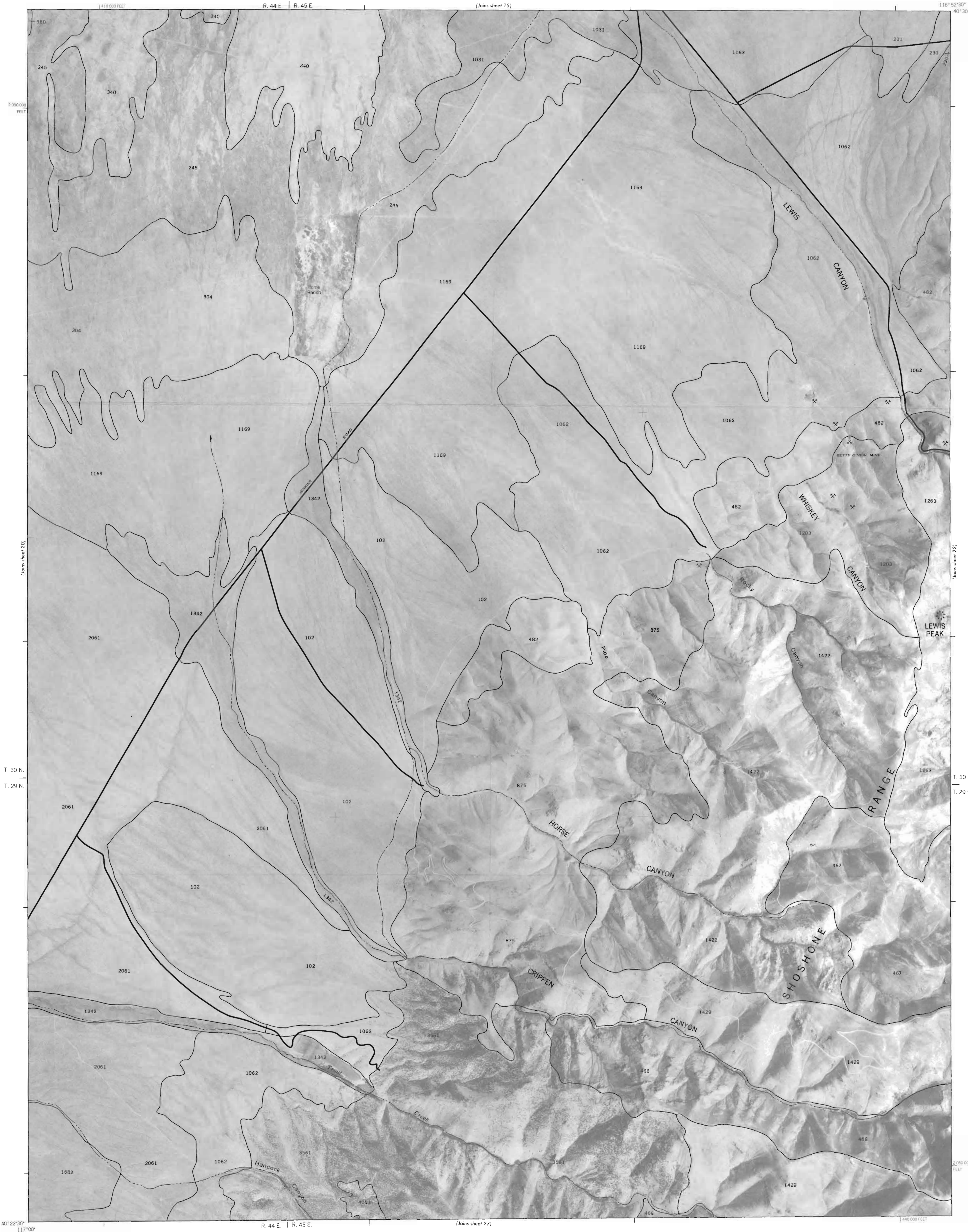
5000 4000 3000 2000 1000 0 5000 10000 Feet

1 .5 0 1 2 3 Kilometers

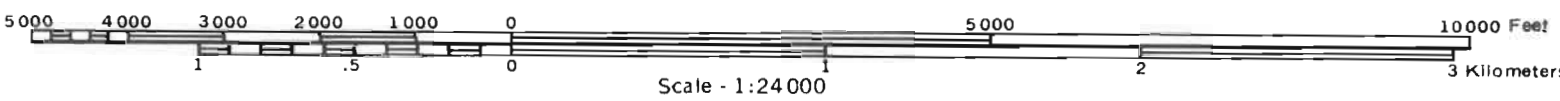
Scale: 1:24,000

LANDER COUNTY, NEVADA, NORTHERN PART NO. 20





This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



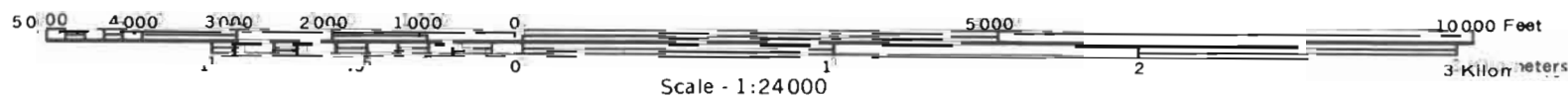
LANDER COUNTY, NEVADA, NORTHERN PART NO. 21





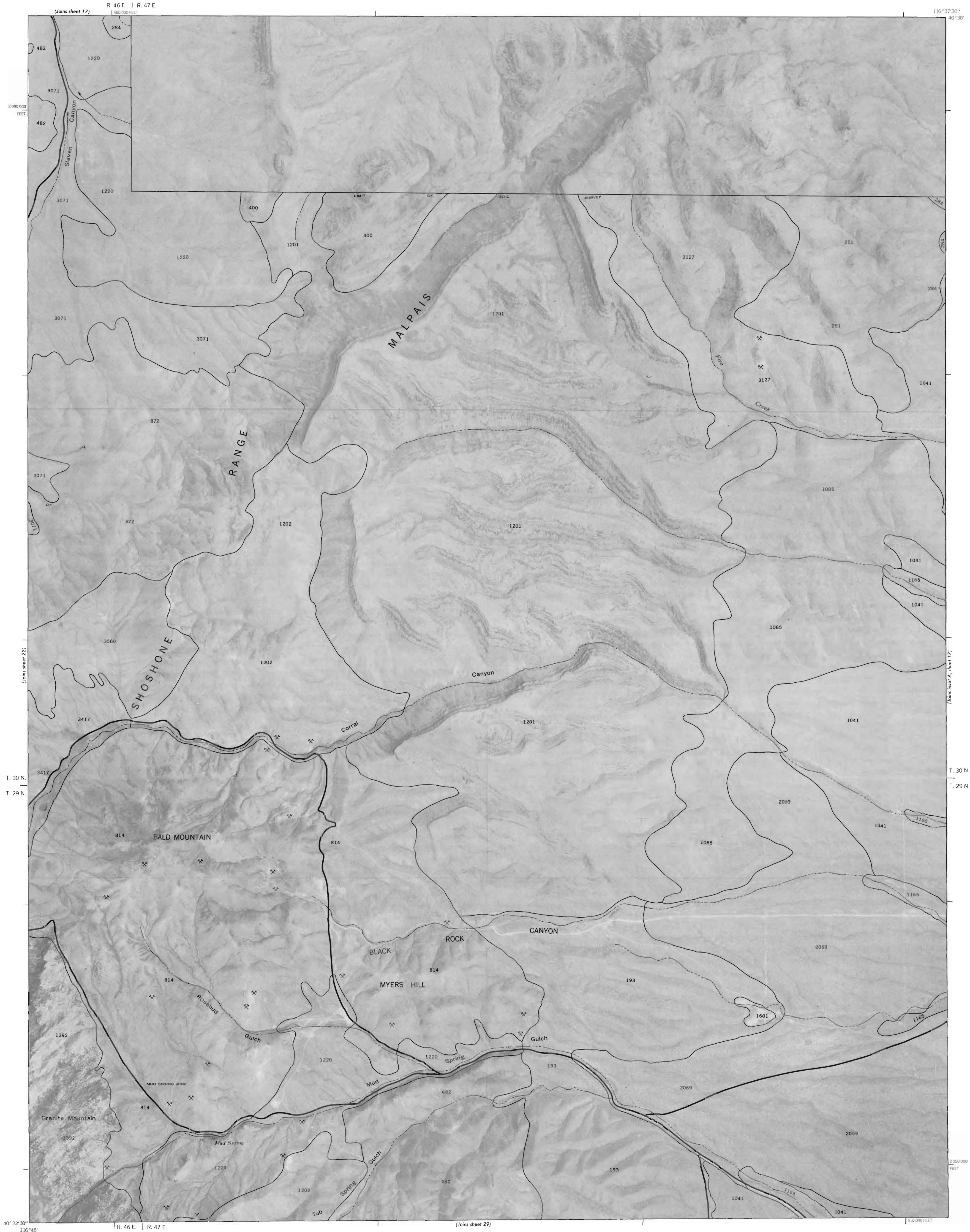


This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTH PART, NO. 22

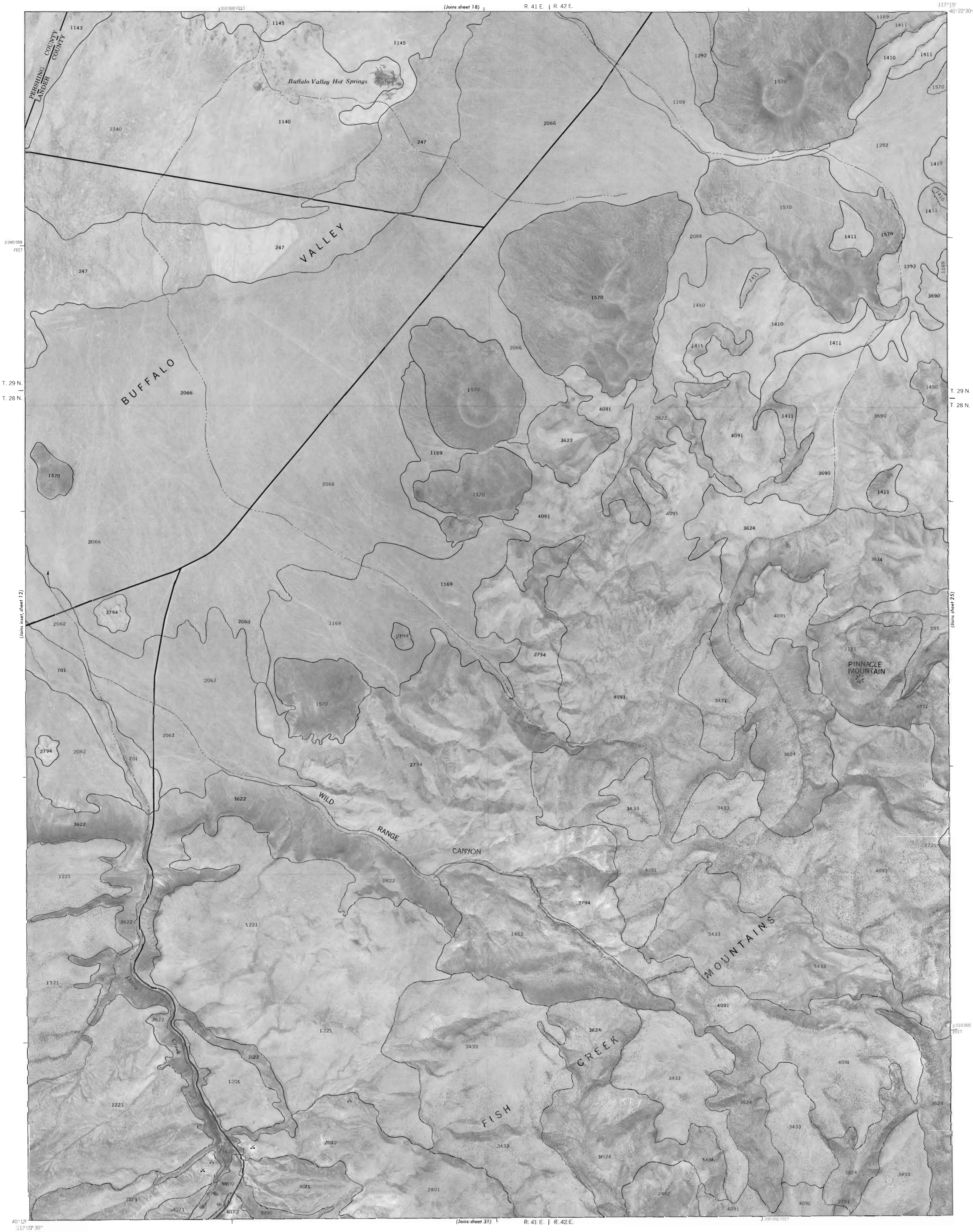




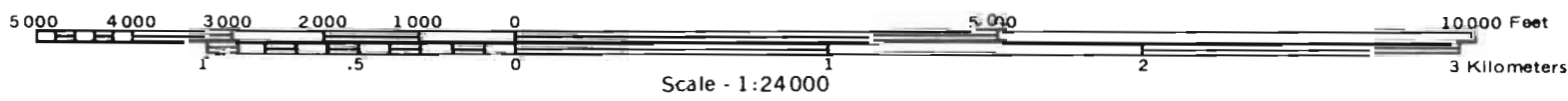
This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTHERN PART NO. 23





This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTH PART NO. 24



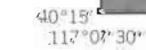


This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTH PART NO. 25

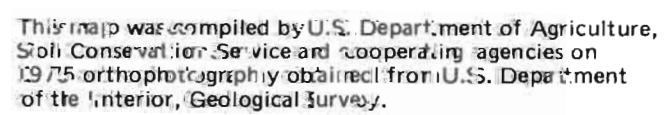




Scale 1:24,000

ISLANDER COUNTY, NEVADA, NORTHERN PART NO. 26





Scale - 1:24 000

LANDER COUNTY, NEXADA, NORTHERN PART NO. 27

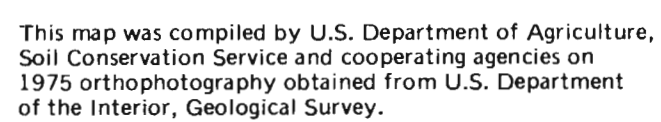




This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTHERN PART NO. 28





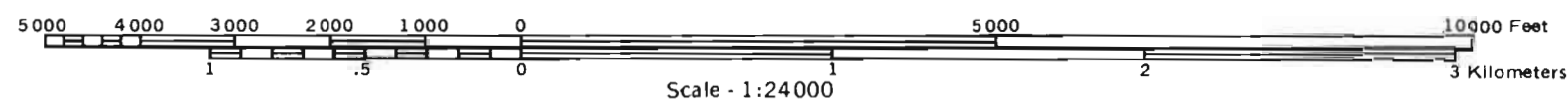
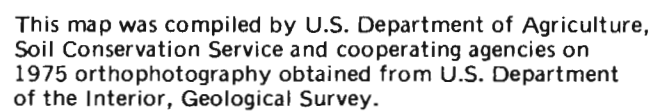
5000 4000 3000 2000 1000 0 5000 10000 Feet

1 1.5 0 1 2 3 Kilometers

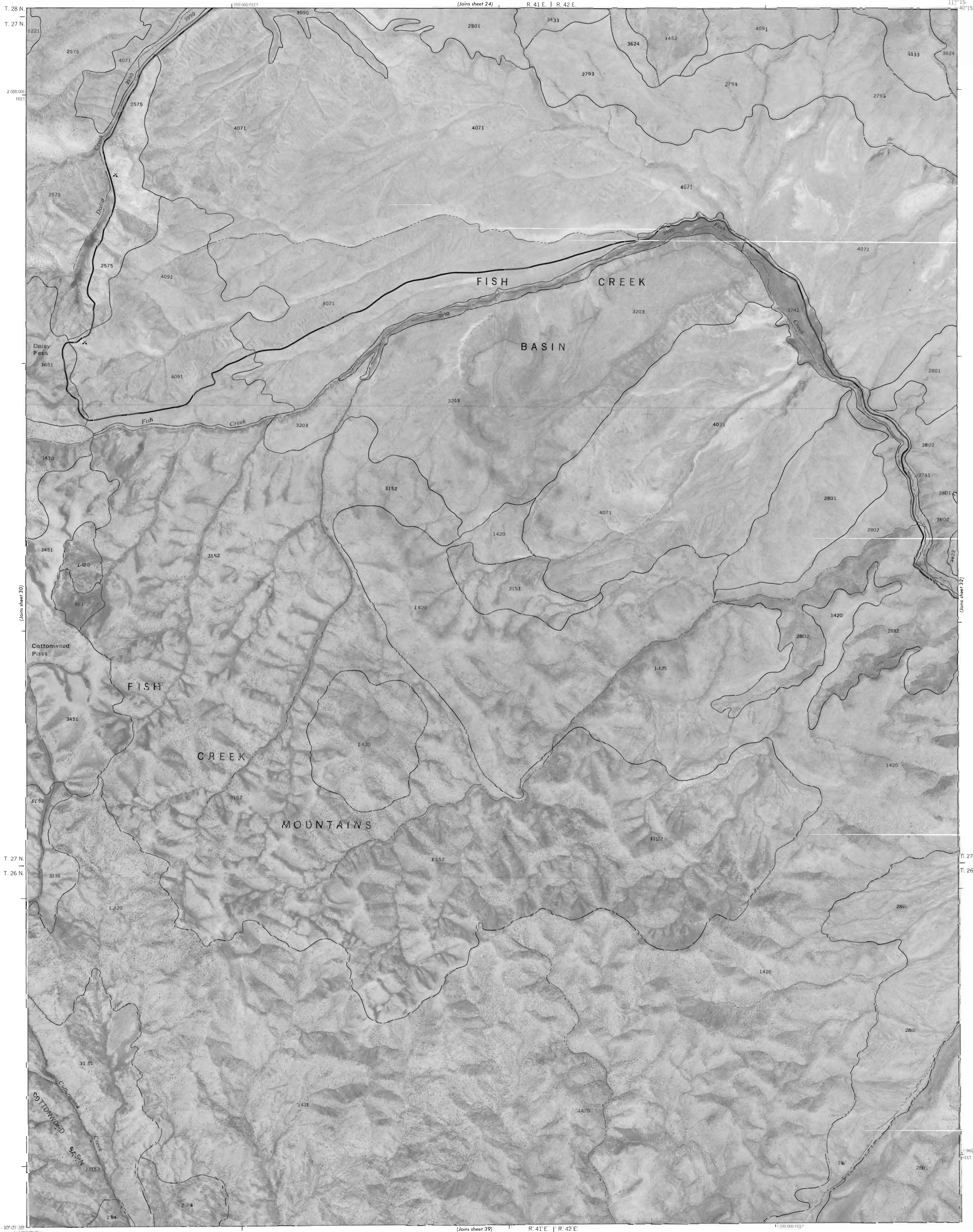
Scale - 1:24,000

LAND &amp; COAST, NEVADA, NORTHERN PART. NO. 29

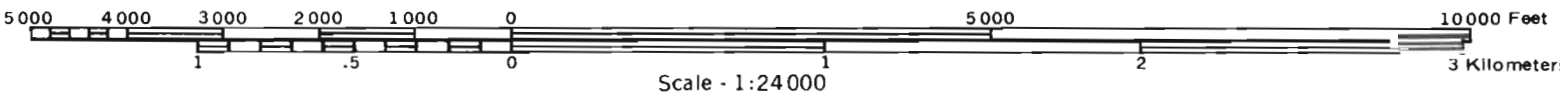








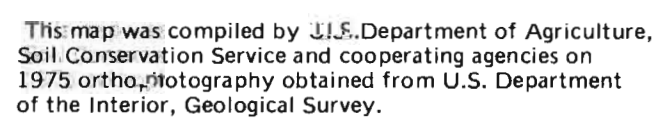
This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTH PART (NO. 31)





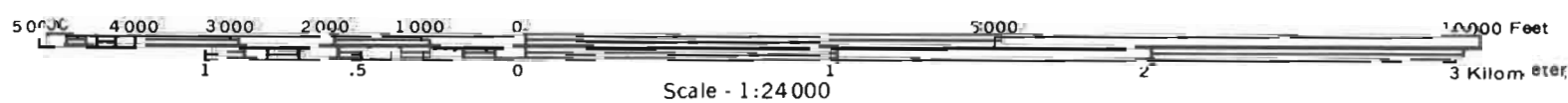


LANDER COUNTY, NEVADA, NORTHERN PART: NO. 32



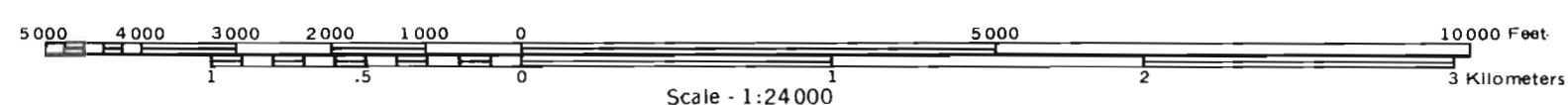
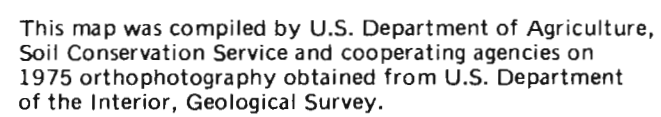


This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.

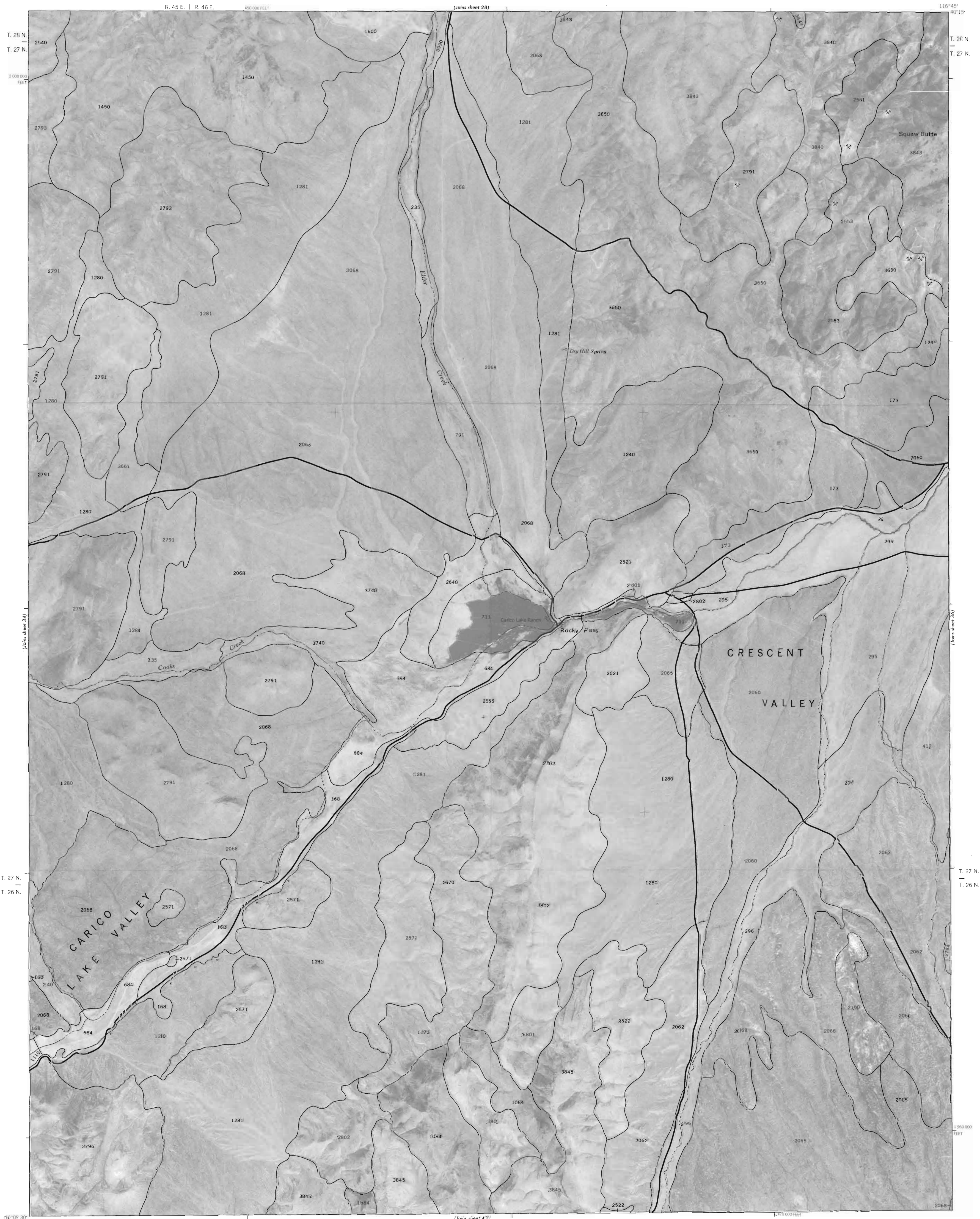


LANDER COUNTY, NEVADA, NORTH PART, SHEET 33





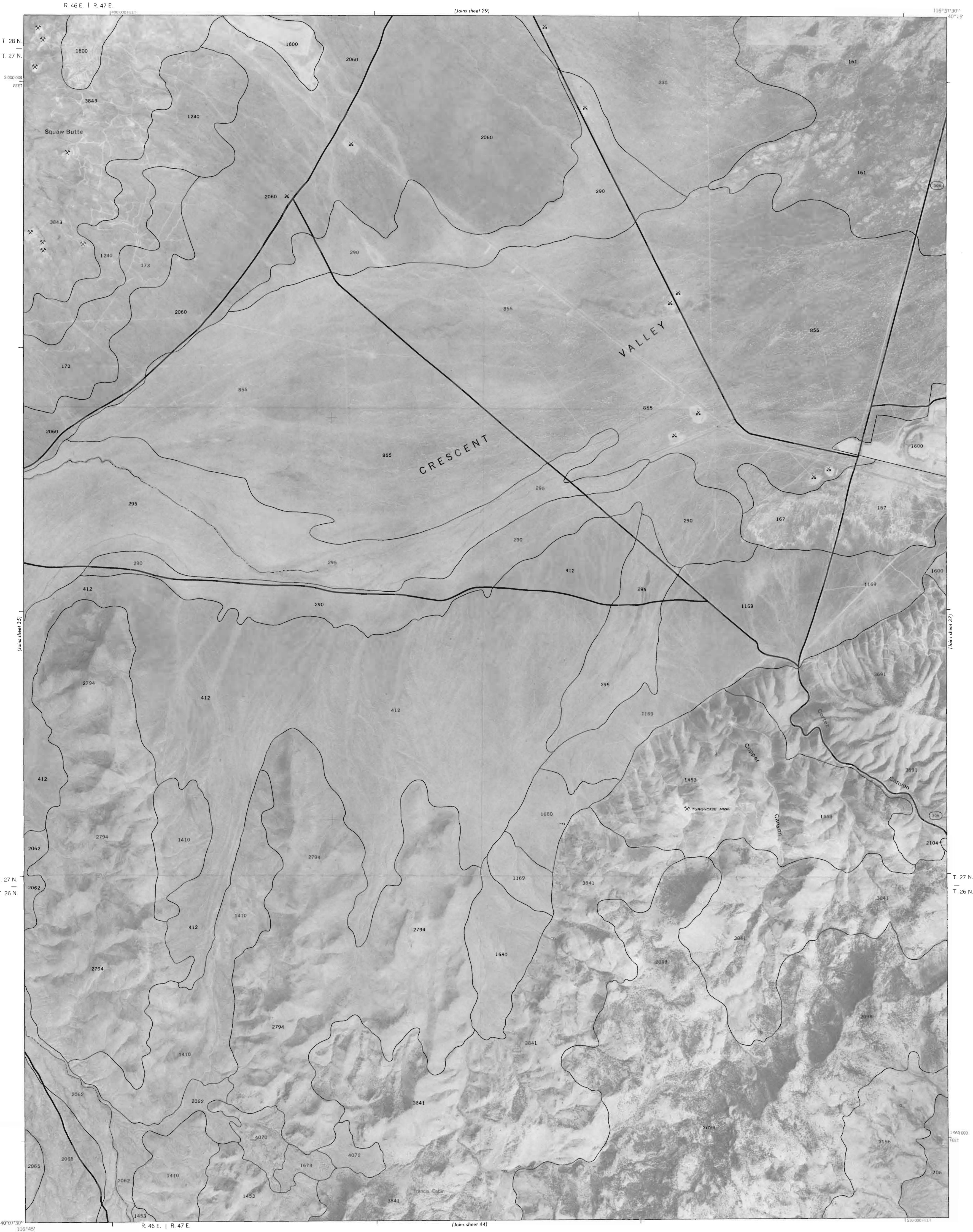




This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTH PART, NO. 35





This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTHERN PART NO. 36







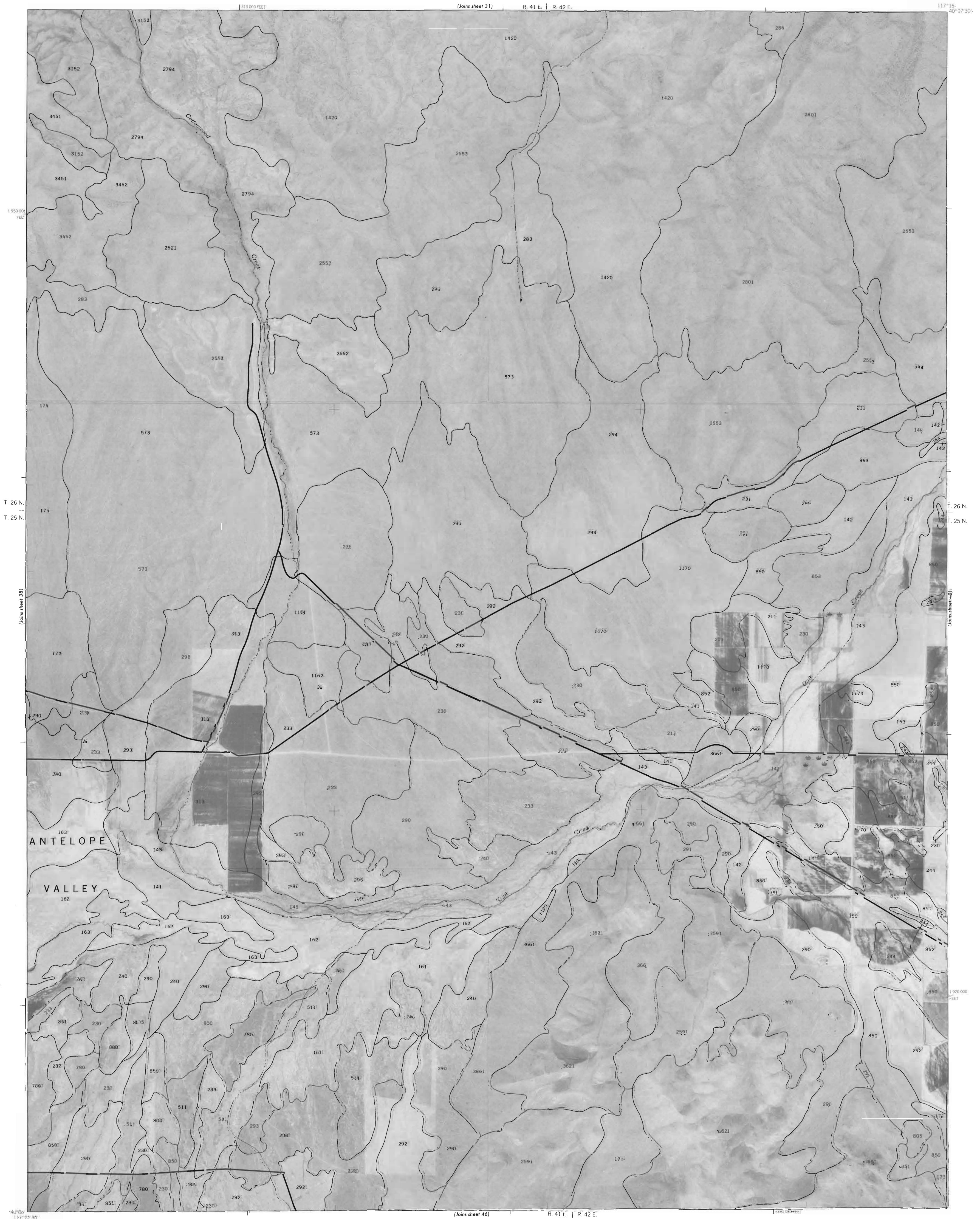


This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.

5000 4000 3000 2000 1000 0 5000 10000 Feet  
1 1.5 2 3 Kilometers  
Scale - 1:24000

LANDER COUNTY, NEVADA, NORTH PART NO. 38

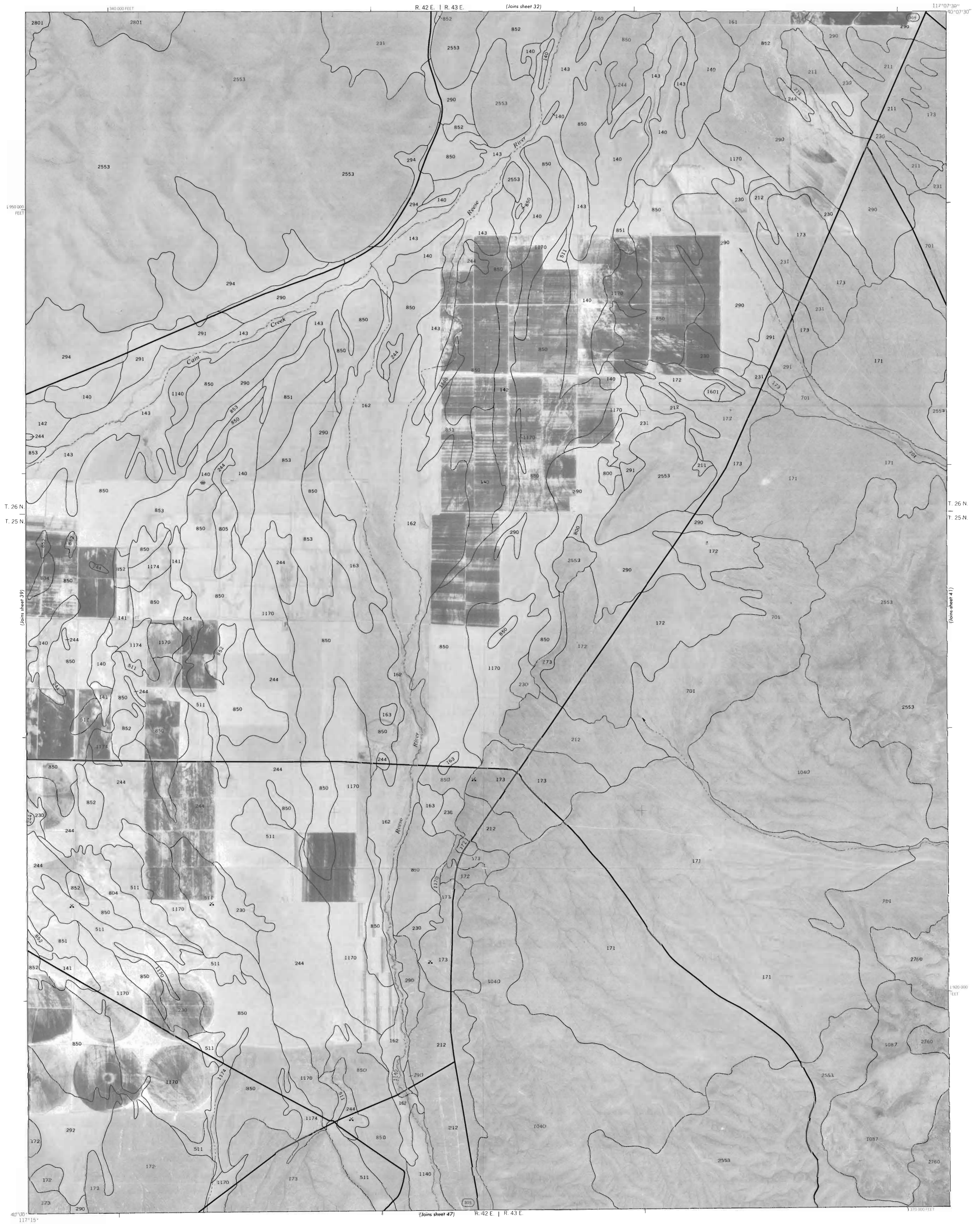




This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTH PART, NO. 39





This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

LANDER COUNTY, NEVADA, NORTHERN PART (NO. 40)





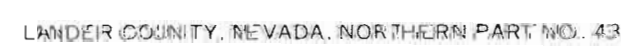
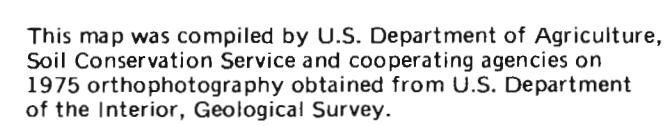
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

LANDER COUNTY, NEVADA NORTH PART SHEET NO. 41





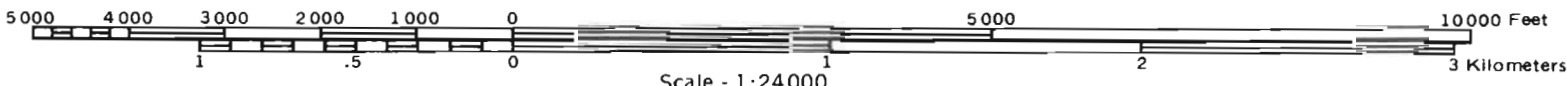








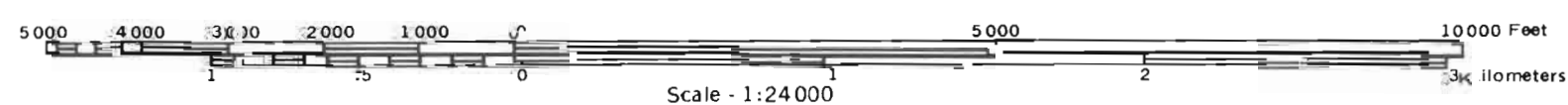
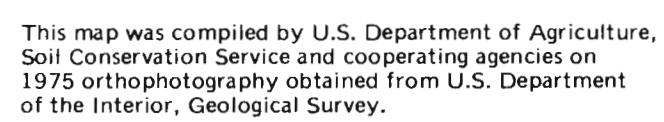
This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



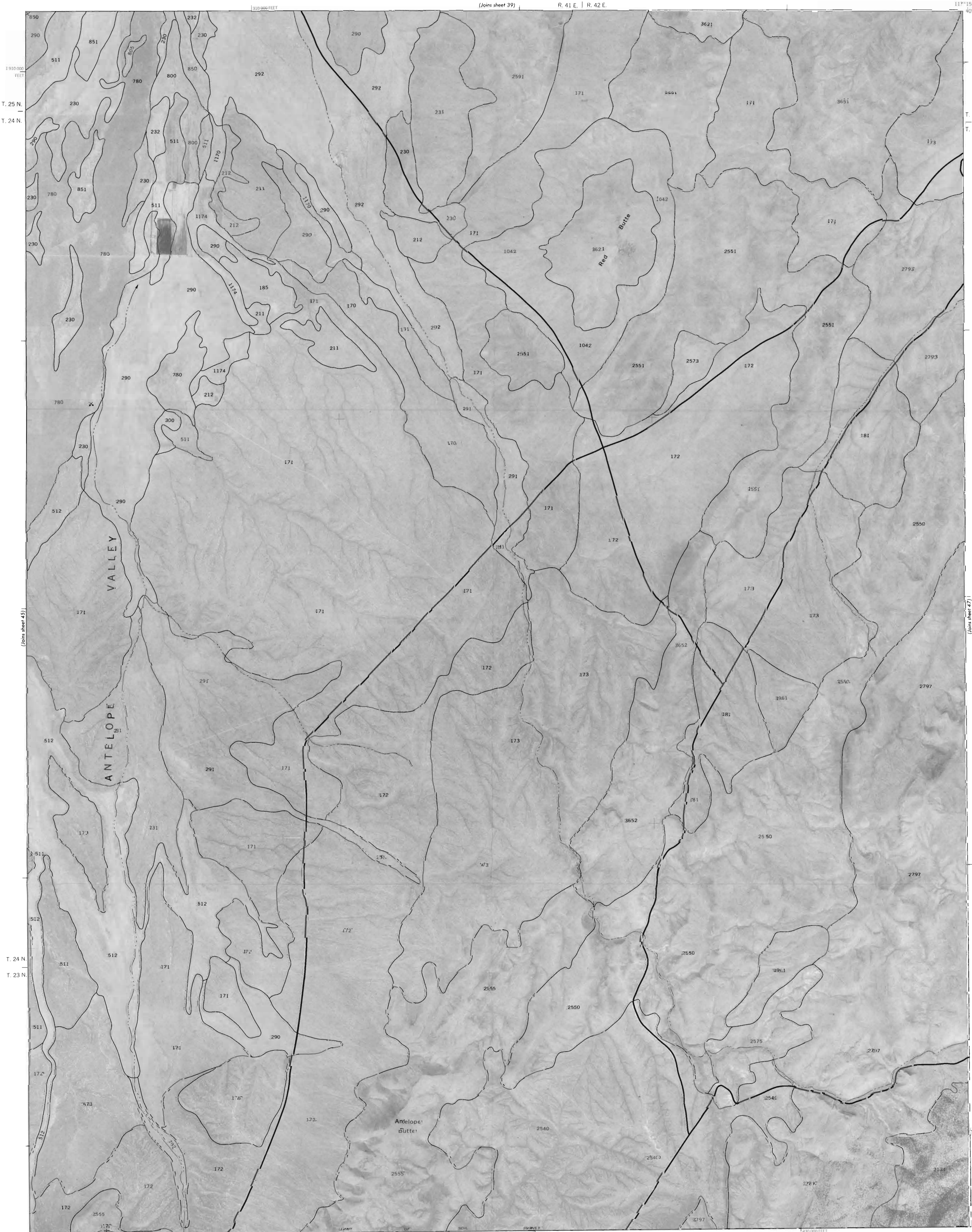
LANDER COUNTY, NEVADA, NORTH PART NO. 44



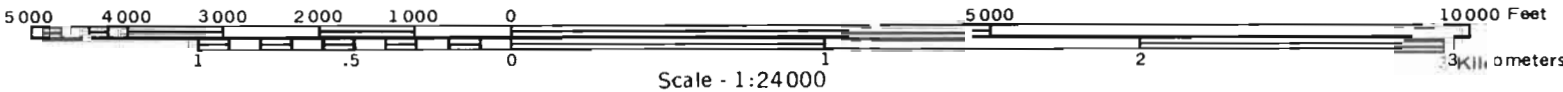








This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.

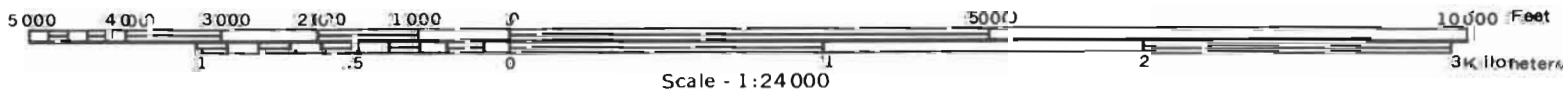


LANDER COUNTY, NEVADA, NORTH PART, NO. 46





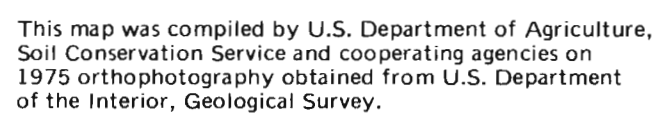
This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTH PART, SHEET NO. 47





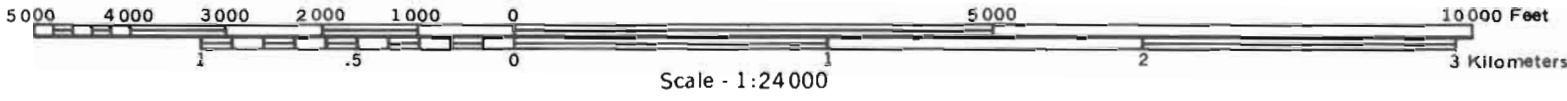


LANDER COUNTY, NEVADA, NORTHERN PART NO. 48





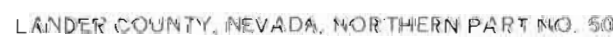
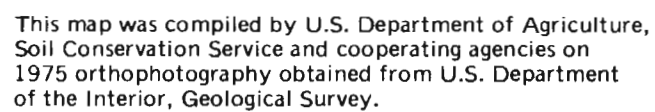
This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTHERN PART NO. 49



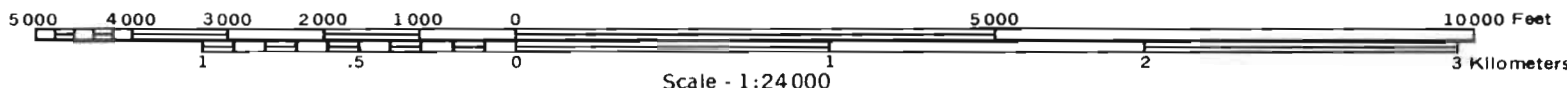








This map was compiled by U.S. Department of Agriculture,  
Soil Conservation Service and cooperating agencies on  
1975 orthophotography obtained from U.S. Department  
of the Interior, Geological Survey.



LANDER COUNTY, NEVADA, NORTHERN PART NO. 51

